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l. 3 June, 1952 No. 6

METEOROLOGICAL ABSTRACTS AND BIBLIOGRAPHY

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METEOROLOGICAL ABSTRACTS AND BIBLIOGRAPHY

MALCOLM RIGBY, Editor

Vol. 3 JUNE 1952 No. 6

SPECIAL FEATURES IN THIS ISSUE

Annotated Bibliography on Stratus Forecasting

Cumulative Author Indexes, January 1950–June 1952

(For complete table of contents see back cover)

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FOREWORD

Meteorological Abstracts and Bibliography is a monthly publication whose purpose is to bring to the attention of meteorologists current literature in their field and in related fields and to provide bibliographic information on various subjects, as interest demands.

Part I contains from 175 to 300 abstracts of current periodical literature and monographs in the fields of meteorology, hydrology, oceanography, etc. These abstracts are arranged according to the Universal Decimal Classification.

Part II of each issue comprises a special annotated bibliography of from 50 to 250 important references on a special subject without respect to recency of material. No attempt is made to prepare exhaustive bibliographies; instead, the aim is to include a representative cross section of the various aspects of a subject. Preference is given to recent material, comprehensive works, material from obscure sources, and items with good bibliographies.

Bibliographies previously published were:

No.	Mo.	Vol. I, 1950	Vol. II, 1951
1.	Jan.	**Atmospheric Pollution**	**Extended Forecasting**
2.	Feb.	**Aerobiology**	**Long Range Forecasting**
3.	March	**Cloud Physics and "Rain Making"**	**Soil Temperature**
4.	April	**Hail**	**Constants, Units, Tables and Diagrams**
5.	May	**Tornadoes**	**Climate of the Near East**
6.	June	**Volcanic Dust**	**Climate of the Middle East**
7.	July	**Climatic Changes**	**Special Winds**
8.	Aug.	**Thunderstorms**	**Radar Storm Detection**
9.	Sept.	**Icing**	**Condensation Trails**
10.	Oct.	**Acoustical Propagation**	**Climate of Northeast Africa**
11.	Nov.	**Evaporation**	**Mountain Meteorology**

Bibliographies published this year were:

1. **Climatology of Northwest Africa,** Vol. III, No. 1, Jan. 1952
2. **Carbon Dioxide,** Vol. III, No. 2, Feb. 1952
3. **Climate of Paraguay, Uruguay and Argentina,** Vol. III, No. 3, March 1952
4. **Dew,** Vol. III, No. 4, April 1952
5. **Objective Forecasting,** Vol. III, No. 5, May 1952
6. **Stratus Forecasting,** Vol. III, No. 6, June 1952

Forthcoming bibliographies will be:

7. **Urban Climatology,** Vol. III, No. 7, July 1952
8. **Climate of Central Africa,** Vol. III, No. 8, Aug. 1952
9. **Visibility,** Vol. III, No. 9, Sept. 1952

Other bibliographies in preparation are:

Actinometers
Climate and Cancer
Climate of Southeast Asia and the East Indies
Frost and Frost Forecasting
Glazed Ice
High Level Winds
Machine Methods in Meteorology
Microwave Propagation
Oceanographic Meteorology
Ozone
Tropopause Variations
Turbulence

Part III contains a listing of the contents of those journals which are primarily meteorological. These are published in the earliest issue where space permits.

Part IV is made up of author, subject and geographical indexes. In the June and December issues cumulative indexes are published.

EXPLANATIONS

Location of material: For each entry, a symbol is given for at least one library where the material may be found. The Union List of Serials (Gregory) is the source of most of the symbols used. In some cases, where no symbol has been assigned to a library, one will be devised according to the principles of the Union List.

Library symbols used frequently may be found in the following list:

DA:	U. S. Dept. of Agriculture Library, Washington, D. C.
DBS:	U. S. Bureau of Standards Library, Washington, D. C.
DGS:	U. S. Geological Survey Library, Washington, D. C.
DLC:	Library of Congress, Washington, D. C.
DSI:	Smithsonian Institution Library, Washington, D. C.
DWB:	U. S. Weather Bureau Library, Washington, D. C.
GB-MO:	Great Britain, Meteorological Office Library, Harrow, England.
MH-BH:	Harvard University, Blue Hill Observatory (and American Meteorological Society) Library, Milton, Mass.
NN:	New York Public Library, New York, N. Y.
NNA:	American Geographical Society Library, New York, N. Y.

Other symbols:

*	before an entry indicates a good data source.
†	before an entry indicates a good bibliography.
§	before an entry indicates a synoptic case history study accompanied by charts

Geographic locations are in the English form rather than the form used locally, for example Moscow for Moskva.

Titles of articles or monographs are in the language of the original article unless otherwise stated. Slavic (Cyrillic) titles are transliterated into the Roman alphabet according to the Library of Congress transliteration scheme.

Abbreviations:

Titles of periodicals are not abbreviated, as a rule.

The months of the year from March to July are not abbreviated. Other months are abbreviated as Jan., Feb., Aug., Sept., Oct., Nov., and Dec.

The word or abbreviation for Volume (Tom, Band, Jahrgang, Año, etc.), for Number (Heft, Fascicule, Vypusk, etc.) and for page or pages is omitted from most entries. Thus an entry will read as follows:

Meteorologische Rundschau, 2(5–6):146–151, May–June 1950.

This indicates that the article appeared in *Meteorologische Rundschau*, *Jahrgang* 2 (Vol 2), *Heft* 5–6 (No. 5 and 6), *pages* 146–151, May–June 1950.

PART I. ABSTRACTS OF CURRENT METEOROLOGICAL MATERIAL

COMPENDIUM ARTICLES AND WORKS OF SPECIAL INTEREST

3.6–1 551.509.33

†Baur, Franz, **Extended-range weather forecasting.** (In: **Compendium of meteorology.** Boston, American Meteorological Society, **1951.** p. 814–833. 12 figs., 6 tables, 58 refs.) **DWB**—Begins by showing statistically that *Grosswetter* exists and varies significantly from year to year. Volcanic eruptions, ocean currents, ice, polar motions and regular pressure waves are inadequate as causes. Persistence, repetition of type, correlation of successive months and sunspots give some indications of future weather. Solar radiation governs large scale weather in a complex way. Types of circulation shown by zonal and meridional indexes and 500 mb isohypses are discussed. Development of high level anticyclones, principal forms of general circulation and 7 types of *Grosswetter* in Europe and N. Atlantic are described; the last show a real calendar relation especially on key days but not sufficient for extended forecasts. In medium range forecasting (2–5 days) only a synoptic statistical method is hopeful, using multiple correlation tables or "mean circulation" methods. Long range forecasting is briefly and unhopefully discussed. Of the references, 20 are to BAUR's own publications. *Subject Headings:* **1. Extended forecasting 2. Grosswetter.**—*C.E.P.B.*

3.6–2 551.509.5

Brier, Glenn W. and Allen, Roger A., **Verification of weather forecasts.** (In: **Compendium of meteorology.** Boston, American Meteorological Society, **1951.** p. 841–848. 5 tables, 11 refs., equations.) **DWB**—Purposes of verification are: testing economic value (very difficult), administration (checking ability of forecasters) and scientific (improving methods). Difficulties include degree of objectivity in terminology and specification of a scale of "goodness." Methods summarized are: contingency tables, average or root-mean-square error and correlation. Advantages of forecasts expressed as probabilities are emphasized. Standard of comparison (chance, climatic, etc.) and allowance for difficulty of forecast are discussed. Many points need further investigation. *Subject Heading:* **1. Forecast verification.**—*C.E.P.B.*

3.6–3 551.509.31

†Bundgaard, Robert C., **A procedure of short-range weather forecasting.** (In: **Compendium of meteorology.** Boston, American Meteorological Society, **1951.** p. 766–795. 12 figs., 3 tables, 83 refs., equations.) **DWB**—This guide to advanced forecasting summarizes part of forthcoming Carnegie Institution's "Dynamic meteorology and weather forecasting." The "synoptic cycle" comprises epignosis (checking former prognostic maps), diagnosis and prognosis of a smoothed map of developments and associated weather. Prognosis of surface map is: 1) geometric extrapolation and 2) physical (frontal development, cyclogenesis, etc.) which is analyzed at length with prognostic rules. Discussion includes frontal occlusions, degeneration and regeneration, local modification by topography and by temperature differences. Prognosis of upper air maps is by layers and deals with thermal lows (Europe, July 17–18, 1944), isobaric advection, transisobaric and vertical motion and 48-hour extrapolation of long waves. Finally, prediction of weather is considered (partly by computing or nomograms) for temperature, hydrometeors, winds, tornadoes and aircraft icing. Much literature is discussed. *Subject Headings:* **1. Synoptic analysis 2. Short range forecasting.**—*C.E.P.B.*

3.6–4 551.509.312:551.511

Charney, Jule G., **Dynamic forecasting by numerical process.** (In: **Compendium of meteorology.** Boston, American Meteorological Society, **1951.** p. 470–482. 4 figs., 15 refs., 75 equations.) **DWB**—Sets out the basic assumptions and describes simplified models

Advective models ignore the effect of vertical motion on potential temperature. Variou numerical methods (e.g., KIBEL, EXNER) of integrating the equations are described. Unde the linearized barotropic model, author discusses group velocities of disturbances, deducin eastward propagation. A method of integrating a nonlinear barotropic equation on the Enia is illustrated and a 24-hour forecast of 500 mb tendencies compared with observed values wit good results. Finally, the possibility of using the primitive Eulerian equations for sma perturbations in a barotropic atmosphere and the inclusion of condensation and friction effect are discussed. *Subject Headings:* **1. Dynamic meteorology 2. Mathematical forecasting.**—*C.E.P.B.*

3.6–5 551.509.3

†Dunn, Gordon E., **Short-range weather forecasting.** (In: **Compendium of meteorology** Boston, American Meteorological Society, **1951.** p. 747–765. 6 tables, 59 refs.) **DWB**— This general discussion divides forecasting into analysis and preparation of prognostic charts both preferably at a center, and actual forecasting, which needs decentralizing. Use of workin charts includes physical reasoning, analog sequences, weather map types and upper air data i radiograms, constant pressure charts, etc. Steering of depressions is fully discussed. Th 24-hour prognostic charts, especially for 700 mb and M.S.L., are considered and the processe of district forecasting described, especially prognosis of various weather elements. Statistica aids and forecasting organization are briefly considered. Needed research listed include general circulation, anomalies, forecasting precipitation, behaviour of depressions, etc *Subject Heading:* **1. Synoptic forecasting.**—*C.E.P.B.*

3.6–6 551.509.3

Elliott, Robert D., **Extended-range forecasting by weather types.** (In: **Compendium o meteorology.** Boston, American Meteorological Society, **1951.** p. 834–840. 2 figs., 2 refs.) **DWB**—After a general introduction, the California Institute of Technology weathe type technique is described. This is based on the succession of 3-day types and associate upper level patterns (alternating meridional and zonal); these are illustrated in 10 schemati maps. Types are related to eddy motion on a cyclonic scale with a mean length of 6 days an a mode of 3 days. Change of type is associated with hemispheric interaction, in which sys tematic movements appear; these are handled statistically through the 46 year type catalog Frequencies of winter types year by year show a tendency for meridional types to predominat at sunspot maxima and minima. *Subject Headings:* **1. Extended forecasting 2. Sunspo effects 3. Weather types.**—*C.E.P.B.*

3.6–7 551.51

Klein, W. H., Winston, J. S., Aubert, E. A., Clem, L. H., Oliver, V. J. and Hawkins H. F., **The weather and circulation of Jan. 1950 . . . Dec. 1951.** *Monthly Weather Review* Jan. **1950**–Dec. **1951. DWB**—A series of articles relating anomalies of the weather element (temperature, rainfall, snow, cloudiness, sunshine, radiation, etc.) observed in the Unite States during the month to the mean circulation pattern in the Northern Hemisphere at se level and aloft during the same period. Prevailing tracks of cyclones and anticyclones ar also described and related to both the weather and the circulation pattern. The explanatio relies primarily upon the field of monthly mean 700 mb heights and its departure from normal occasionally supplemented by 5- and 15-day means. Some of the articles discuss the geo graphical distribution of such elements as the geostrophic wind speed (Nov. and Dec. 1950) the relative and absolute vorticity (Jan. and Feb. 1951), the moisture content of the air (Jul 1951), the thickness anomaly for the layer between 1000 and 700 mb (Nov. 1951), the inter diurnal pressure variability (Dec. 1951) and the frequency of cyclone and anticyclone track (Dec. 1951). Discussion of the index cycle (March 1951), seasonal and yearly temperatur patterns (Sept. 1951) and the evolution within the month (Feb. 1950) is also included *Subject Headings:* **1. General circulation 2. Weather 3. United States.**—*M.R.*

3.6–8 551.509.3

Namias, Jerome, **General aspects of extended-range forecasting.** (In: **Compendium o meteorology.** Boston, American Meteorological Society, **1951.** p. 802–813, 25 refs.,

equations.) **DWB**—The article considers theory of forecasting for periods above 48 hours up to a month, tracing evolution from TEISSERENC DE BORT (action centers) through BAUR and MULTANOVSKIĬ to ROSSBY (planetary waves). He then discusses methods—lag correlations (fail through rigidity), trend and smoothing (some success, due to persistence), singularities (used partially in France), symmetry points (unsuccessful), weather types and analogs (*see items* No. 3.6–1 and 3.6–6 above) and physical or kinematic methods based on upper waves. Difficulties of translating predicted circulation into weather are set out. The possibility of monthly forecasts based on 30-day maps is favorably considered. On the whole, the author looks forward to "an asymptotic approach to perfection." *Subject Heading:* **1. Extended forecasting.**—*C.E.P.B.*

3.6–9 551.513.1 551.551

†Sheppard, P. A., **The general circulation of the atmosphere.** *Science Progress*, London, 40(157):89–106, Jan. **1952.** 7 figs., 29 refs. **DWB**—An analytical summary of much recent literature. The three-dimensional wind circulation and the temperature field are described. The system of winds required for radiation balance by heat transport from low to high levels and latitudes is shown to make turbulence dynamically necessary. The possibilities of meridional circulations or eddy flux for momentum transfer are examined, but no conclusion is yet possible. Observed features of the circulation are analyzed; the main difficulty is the lack of accurate knowledge of drag coefficients of surface friction. Direct computations of momentum transport by PRIESTLY and STARR and WHITE are compared and major transport is located in the subtropical jet. Estimates of transfer of sensible and latent heat and of water vapor are described but "a fascinating problem involving many branches of physics remains to be solved." *Subject Headings:* **1. Atmospheric circulation 2. Momentum transfer.**—*C.E.P.B.*

3.6–10 551.509

Willett, Hurd C., **The forecast problem.** (In: **Compendium of meteorology.** Boston, American Meteorological Society, **1951.** p. 731–746. 18 refs.) **DWB**—The slight progress of forecasting in 40 years is attributed partly to shortage of trained forecasters and too many charts but mainly to lack of understanding of basic problems. Degree of success of forecasts of different time ranges is discussed. Extrapolation techniques are statistical (correlation, periodicity), synoptic (recently applied to upper level charts), kinematic analysis, and mathematical (BJERKNES, ROSSBY). Physical techniques include air mass and frontal analysis, and consideration of modifying factors. Possible progress by technical improvements, standardization and training is limited; the basic requirement is a quantitative physical model of the whole general circulation and its synoptic application, and relations to variations of solar activity. This requires a research program under one central international establishment. *Subject Heading:* **1. Weather forecasting.**—*C.E.P.B.*

GENERAL METEOROLOGY

3.6–11 551.5:06

Atti del Convegno Internazionale di Meteorologia Marittima. Genova: 20–22 Settembre 1951. Rendiconti delle Sedute. [Proceedings of the International Meeting on Maritime Meteorology, Genoa, Sept. 20–22, 1951.] *Geofisica Pura e Applicata*, 21:1–6, **1952. MH-BH.** Summary in: *Meteorological Magazine*, London, 81(955):21–24, Jan. **1952.** Also in: *Meteorologische Rundschau*, 5(1/2):21, **1952. DWB**—After a brief resume of proceedings including mention of the papers read, the six unanimously adopted resolutions are presented. Stressed in the resolutions is the need for standardization and elaboration of marine meteorological observations, expansion of the oceanography and meteorology educational program in Italy, and encouragement of research, particularly in the Mediterranean area. *Subject Headings:* **1. Conferences 2. Marine meteorology.**—*M.P.K.*

3.6–12 551.5:06

Flohn, Hermann, **Eindrücke von der IX. Generalversammlung der Union Géodesique et Géophysique Internationale.** [Impressions of the 9th General Assembly of the I.U.G.G.)

Erdkunde, 6(1):48–50, Feb. 1952. **DLC**—The meeting in Brussels included much of interest to meteorologists. The strongest impression is of the vigorous subsidized research, especially in oceans and atmosphere up to 215 km, but bureaucratic control is a danger. A general account of the discussions and excursions is given. German science maintains a nucleus of its former high standard in spite of difficulties of research in universities. *Subject Headings:* **1. Geophysical congresses 2. International organizations 3. International Union of Geodesy and Geophysics.**—*C.E.P.B.*

3.6–13 551.5:06

La IX.ème Assemblée Général de l'Union Géodésique et Géophysique International à Bruxelles, 16 Août–1er Septembre 1951. [The ninth general assembly of the I.U.G.G. in Brussels Aug. 16–Sept. 1, 1951.] *Geofisica Pura e Applicata*, 20:203–205, July–Dec. 1951. **MH-BH**—Report on activities of General Assembly and of the Mixed Commission on Internal Physics of the Globe, Sub-Commissions on actinometry and Commission on Instruments and Methods of Observation, the Association of Geodesy (LAMBERT elected president), Seismology (GUTENBERG), Meteorology (RAMANATHAN), Terrestrial Magnetism and Electricity (COULOMB), Physical Oceanography (PROUDMANN), Volcanology (ESCHER) and Hydrology (V. FROLOW). The next meeting of the I.U.G.G. will be at Rome in Sept. 1954. PROF. S. CHAPMAN was elected to the presidency. *Subject Headings:* **1. International organizations 2. Geophysical congresses 3. International Union of Geodesy and Geophysics.**—*M.R.*

3.6–14 551.5:523.43

Kubashev, B. M., **Novye dannye o meteorogicheskikh usloviiakh na Marse.** [New data on meteorological conditions on Mars.] *Priroda*, Moscow, 40(1):46–48, Jan. 1951. 2 figs., 5 refs. **DLC**—The author describes the techniques for observation of radiation and thermal conditions on Mars and analyzes the charts constructed by S. L. HESS (*see item* No. 5–9 in May 1950 *Meteorological Abstracts*) of pressure and temperature distribution on the surface of Mars. *Subject Headings:* **1. Planetary atmospheres 2. Mars.**—*C.K.*

3.6–15 551.5:523.7

*Bell, Barbara, **A study of Doppler and damping effects in the solar atmosphere.** Harvard University, Contract W 19-122ac-17, Special Report No. 35, Jan. 12, 1951. 205 p. figs., 92 refs., equations, 2 append. **DWB**—In Pt. I, previous work on absorption line profiles (Döppler effect, radiation and collision damping and the atomic absorption coefficient) and on the curve of growth (including solar turbulent velocities) are thoroughly reviewed. In Pt. II, the observational data are analyzed on the basis of the "Ütrecht Photometric Atlas" of the solar spectrum. Results of measurements of equivalent width are 15% larger than those of ALLEN. Pt. III consists of analysis of half widths and profiles of FRAUNHOFER lines; Pt. IV, the curves of growth and solar line strength and Pt. V, an outline for future solar and spectrographic programs. Conclusion from analysis of Döppler velocities was that there was no evidence for turbulent velocities in excess of ½ km/sec, and that solar kinetic temperatures increase from 11,500° to 20,000° at the upper reversing layer, and agrees with value of 30,000° for the chromosphere obtained by REDMAN. Both Döppler velocities from profiles and from the curve of growth give 17,600° for low EP lines of neutral iron. *Subject Headings:* **1. Solar temperature 2. Stellar atmospheres 3. Döppler effect 4. Turbulence spectrum. I. Harvard University II. Contract W 19-122ac-17.**—*M.R.*

3.6–16 551.5:621.9:551.577.11

Kerker, Milton and Hitschfeld, Walter, **Effect of particle shape and secondary scattering on microwave reflections from clouds and precipitation.** McGill University, Macdonald Physics Laboratory, "Stormy Weather" Research Group, Contract AF-19(122)-217, Research Report NW-1, March 1951. 32 p. 6 figs., 3 tables, 11 refs., 23 equations. **DWB**—In order to distinguish between rain and snow when interpreting microwave returns (from radar), the effects of particle shape on the intensity and polarization of the beams is considered. The data for scattering by small randomly oriented rod-shaped and plate-shaped (prolate and oblate) spheroids is given in tables and the data obtained for secondary scattering compared

graphically. It is concluded that the scattering cross section for a particle of given volume is least for a sphere, greater by a factor of <2 for ice spheroids and much greater for water particles when deformation is extreme. *Subject Headings:* **1. Radar precipitation echoes 2. Microwave scattering. I. McGill University. Macdonald Physics Laboratory. "Stormy Weather" Research Group II. Contract AF-19(122)-217.** *M.R.*

3.6–17 551.5:629.13

500th flight over North Pole. *U. S. Air Services*, Washington, D. C., 36(10):16, Oct. 1951. **DLC** —Brief account of the 58th Strategic Weather Reconnaissance Squadron's activity and its 500th flight over the North Pole. The squadron's commander is quoted as declaring that the flights, so far, covered "the indoctrination phase" of the project and that the squadron is "now ready to embark on the routine phase." *Subject Headings:* **1. Arctic flying 2. Airplane weather reconnaissance.**—*G.T.*

3.6–18 551.5:778.5

U. S. Weather Bureau, **A list of motion picture films relating to meteorology.** *U. S. Weather Bureau, Library Circular*, 7(9), Pt. 3, [n.d.]. 12 p. **DWB**—Title, producer, distributor, date, length, purchase and rental price of 24 films under "meteorology," 9 under "climatology" and 16 under "weather activities" are listed and brief summaries and remarks as to suitability for educational purposes added. All films are 16mm and three are available on 35mm as well; several are in sound and color. Length varies from 9 to 47 minutes. Some of the films dealing with atmospheric phenomena are highly technical, others use the more elementary method of animation. The films under "climatology" show seasonal changes and their causes without special reference to the climate of any single country. *Subject Heading:* **1. Meteorological films.**—*G.T.*

3.6–19 551.5(02)

Carrasco, Pedro, **Meteorología.** [Meteorology.] Mexico City, Fondo de Cultura Económica, **1945.** 278 p. charts, diagrs., graphs, tables (8 in append.), equations. **DWB**—An elementary textbook (in Spanish) for students of geography and meteorology. The fourteen chapters deal with the subjects usually covered in similar texts, including such topics as: the structure of the atmosphere, instruments, wind and weather, statistical meteorology and local climatology, climatic regions, condensation, air masses and fronts, synoptic forecasting, electrical and optical phenomena. *Subject Headings:* **1. Meteorology 2. Textbooks.**—*M.L.R.*

3.6–20 551.5(03)

Berulfsen, Bjarne and Scavenius, Hjordes, **Gyldendal's English-Norwegian and Norwegian-English dictionary.** New York, David McKay Co. [1949, 1951]. 332, 336 p. **DWB**—A fairly complete, nontechnical dictionary, based on the Norwegian orthography of 1948, and including many words introduced into English or Norwegian during the last war. Equivalents of such familiar terms as cirrus, cumulus, tornado, thunderstorm and turbulence, but not of highly specialized terms like anemometer, actinometer, jet stream, cold front, etc., are included. Many place names are given. *Subject Headings:* **1. Dictionaries 2. Norwegian language 3. English language.**—*M.R.*

3.6–21 551.5(03)

Great Britain. Meteorological Office, **Polish meteorological compendium, Polish-English dictionary of meteorological and aviation terms together with tables and lists of technical phrases in common use by forecasters.** *Great Britain, Meteorological Office, M.O.M.* 410, 1941. 64 p. **DWB** —About 1200 meteorological (and a few aeronautical) terms are given in English with Polish equivalents (and vice versa), and a large number of terms or phrases used in synoptic forecasts given in a separate section under various general heads, such as: Synoptic Analysis Terminology, Weather, Wind, Cloud Amount, Ceiling, Visibility, Freezing Level, Temperature, Beaufort Notations, etc. *Subject Headings:* **1. Glossaries 2. Polish language 3. English language 4. Aeronautical meteorology.**—*M.R.*

3.6–22 551.5(03)

Warrern, Allan, **Dansk-Engelsk teknisk ordbog.** [Danish-English technical dictionary.] Copenhagen, J. F. Clausens Forlag, 1949. 238 p. **DWB**—A fairly comprehensive coverage of terms used in technical (but not scientific) fields such as engineering, aviation, chemistry, metallurgy, radio engineering, etc. Equivalents are given very simply (no attempt is made to give all of the possible meanings or roots of each word). Only a few words applying specifically to meteorology are included, but many words from related fields, encountered in technical meteorological literature, can be found. *Subject Headings:* **1. Technical dictionaries 2. Danish language 3. English language.**—*M.R.*

METEOROLOGICAL OBSERVATIONS AND INSTRUMENTS

METHODS OF OBSERVATION

(*See also items:* 3.6–84, 3.6–101)

3.6–23 551.501:551.506.6

Blyth, J. D. M., **German meteorological activities in the Arctic, 1940–45.** *Polar Record*, 6(42):185–226, July 1951. maps, refs. **DWB**—Report on polar meteorological research conducted by the German Navy and Air Force during World War II. The range of activities is illustrated on three maps, and detailed schedules of each of the parties' enterprises are given as well as names of all personnel on each operation and excerpts from the log books. In addition to airplane reconnaissance activities and temporary stations on East Greenland and Spitsbergen, automatic weather stations were used in the North Atlantic and on neighboring islands. *Subject Headings:* **1. Arctic weather stations 2. Automatic weather stations 3. Polar research 4. North Atlantic.**—*G.T.*

3.6–24 551.501:551.575:551.576(54)

*Ananthakrishnan, R. and Sanker Narayan, P. V., **Observations of some meteorological phenomena from the Kodaikanal Observatory.** *Indian Journal of Meteorology and Geophysics*, 2(4):265–277, Oct. 1951. 8 figs., 4 tables, 2 refs. **MH-BH** Topographic description of the country surrounding the station, instructive photographs and description of the earth's shadow moving along the western sky, of the fog before sunrise and of stratocumulus clouds. Equations for the calculation of the uppermost fog layer and results of measurements, and diurnal course of the heights of the convection layer during fair weather are given. *Subject Headings:* **1. Fog 2. Stratocumulus clouds 3. Kodaikanal, India.**—*A.A.*

3.6–25 551.501(02)

Popov, E. G., **N. A. Belinskiĭ. Morskie gidrometeorologicheskie informatsii i prognozy.** [Review of "Marine hydrometeorological reports and forecasting," by N. A. Belinskii.] *Meteorologiia i Gidrologiia*, No. 4:53–54, Dec. 1950. **DLC**—A student's manual summarizing recent Soviet advances in hydrometeorology, is reviewed. In spite of some shortcomings, the reviewer recommends it as a manual for students and as a handbook for marine forecasters. (*See item* No. 3.2–46 in Feb. 1952 *Meteorological Abstracts.*) *Subject Headings:* **1. Observers' manual 2. Marine forecasting 3. Reviews I. Belinskiĭ, N. A.**—*A.M.P.*

3.6–26 551.501:06(09)(68)

South Africa. Weather Bureau, **Your weather bureau.** Pretoria, Aug. 17, 1951. unpaged. In English and Afkrikaans. **DWB**—A pamphlet written for the inauguration of a new wing of the Weather Bureau building in Pretoria and containing a program of the festivities, a plan of the exhibition and a brief history of South African meteorology and Weather Bureau. A list of 21 first order stations in South Africa and island possessions, gives the status of the stations (6 forecast offices, 20 pilot balloon, 2 rawin, 4 airplane sounding, and 4 radiosonde stations). *Subject Headings:* **1. Meteorological services 2. Radiosonde stations 3. Airplane observational (APOB) stations 4. Observational networks 5. History of meteorology 6. South Africa.**—*G.T.*

3.6–27 551.501.7(09):551.510.5

Quintela, Roberto M., **Las investigaciones meteorológicas de la alta atmósfera.** [Meteorological investigations of the upper atmosphere.] *Pan American Union, Wash., D. C. Boletín de Ciencia y Tecnología*, No. 2:34–44, Aug. **1950.** refs. Mimeographed. **MH-BH**—A general review of the history of upper air research by means of observations of comets, meteors, clouds, auroras, ionospheric storms, balloons, radiosondes, rockets, etc. The structure of the atmosphere, the tropopause and stratosphere, and their variations in space and time are mentioned. The article, written originally in Spanish, has general application with only a few references to conditions in South America. *Subject Headings:* **1. Upper atmosphere research 2. History of meteorology 3. Atmospheric structure.**—*M.R.*

3.6–28 551.501.9

Bleasdale, A., **Climatological observations at Greenwich.** *Meteorological Magazine*, London, 80(952):296–297, Oct. **1951. MH-BH** —Note on transfer of climatological observations from Greenwich Observatory to a nearby site in National Maritime Museum grounds. *Subject Heading:* **1. Greenwich Observatory.**—*C.E.P.B.*

3.6–29 551.501.9:551.521.64

Rose, D. C., **The cosmic ray observatory at Ottawa.** *Nature*, London, 168(4268):269–271, Aug. 18, 1951. 2 photos, ref. **DLC**—Describes the equipment and standardization of an observatory built for the National Research Council of Canada. *Subject Headings:* **1. Astrophysical observatories 2. Canada.**—*C.E.P.B.*

3.6–30 551.501.9:551.584.41

Molga, Marian, **Przedstawiciele meteorologii w Bialowiezy.** [Meteorologists at Białowiez.] *Gazeta Obserwatora PIHM*, Warsaw, 3(11):13–15, Nov. **1950.** 5 figs. **DLC**—An excursion to Białowiez National Park Meteorological Station organized by the Geophysical Section of the first Assembly of Polish Science on Sept. 21, 1950 is described. Observations are made in the forest to aid in the study of forest eco-climate. Several photographs of equipment are included. *Subject Headings:* **1. Forest climatology 2. Meteorological stations 3. Microclimatology 4. Poland.**—*A.M.P.*

3.6–31 551.501.9(98)

Rae, R. W., **Arctic weather stations.** *Weather*, 7(1):3–6, Jan. **1952. DWB** –Popular account of life and weather at the U. S.-Canadian stations in Arctic Canada. *Subject Headings:* **1. Arctic weather stations 2. Canadian Arctic.**

3.6–32 551.501.9(987)

Pantenberg, Vitalis, **Die nördlichste Funk-Wetterwarte der Erde.** [The most northerly radio weather station in the world.] *Polarforschung*, 3(1):69–70, **1951. DWB**—Brief account of erection of U. S.-Canadian station at Alert, near Cape Sheridan, 82°30′N. *Subject Headings:* **1. Weather stations 2. Alert, Canadian Arctic.**—*C.E.P.B.*

OBSERVATIONAL DATA

(*See also items:* 3.6–23, 3.6–160)

3.6–33 551.506.1:551.591(46) 551.506.1:551.576(46)

*Campo Cunchillos, G., **Fenómenos especiales, transparencia de la atmósfera, nubosidad e historial meteorológica en el Observatorio Fabra, durante el año 1949.** [Special phenomena, transparency of the atmosphere, cloudiness and meteorological log at the Fabra Observatory in 1949.] *Barcelona, Observatorio Fabra, Boletín, Sección Meteorológico y Sísmica*, No. 38:225–243, **1951.** entirely data. **DWB** –Tables present number of days with precipitation, snow, hail, etc., daily visibility (0–4) and clouds. A daily meteorological log is given in code. *Subject Headings:* **1. Meteorological elements 2. Visibility data 3. Cloud data 4. Barcelona, Spain. I. (R.) Academia de Ciencias y Artes de Barcelona.**—*M.L.R.*

3.6–34 551.506.1(26)

Great Britain, Meteorological Office, **Meteorological summary for stations Jig (53°50′N, 18°40′W) August 1948–March 1950 and Item (60°00′N, 20°00′W) January 1949–March 1950. O.W.S. Met. Summary III.** London, 1951. [8 p.] figs., 8 tables. Mimeographed. **DWB**—This report gives monthly means and extremes of temperature, means of pressure, wind, low cloud, total cloud, frequencies of height of base and of visibility, and vector mean winds. The diagrams show monthly wind roses and resultants. *Subject Headings:* **1. Ocean weather stations 2. Marine meteorological data.**—*C.E.P.B.*

3.6–35 551.506.1:629.13(058)(595)

*Malaya. Meteorological Service, **Frequency tables (low cloud, visibility, sunshine) and anemogram analysis, 1938 to 1941, 1946.** Singapore, 1939, 1950. tables. **DWB**—Detailed data for thrice-daily observations at a score of stations. Frequency of extreme wind speeds, and pressure data are given in addition to the main tables of occurrence of ceiling, visibility and bright sunshine within certain class limits. *Subject Headings:* **1. Annual reports 2. Airways data 3. Malaya. I. Moorhead, H. B. F.** (*ed.*).—*M.R.*

3.6–36 551.506.3(410)

Glasspoole, J., **The prolonged unpleasant weather of 1950–51.** *Meteorological Magazine*, London, 80(952):283–284, Oct. 1951. 2 tables. **MH-BH**—Gives monthly means of temperature, rainfall and sunshine over England and Wales, Scotland and N. Ireland, July 1950–May 1951, and comparison with previous cold periods. *Subject Headings:* **1. Weather 2. British Isles.**—*C.E.P.B.*

3.6–37 551.506.3(436)

von Rudloff, H., **Bemerkungen zum "heissen Sommer 1950 in Graz."** [Remarks on "The hot summer of 1950 in Graz."] *Zeitschrift für Meteorologie*, 5(9):285–286, Sept. 1951. table. **MH-BH**—Referring to S. Morawetz on this subject (*see item* No. 2.7–27 in July 1951 *Meteorological Abstracts*) author tabulates hottest summers in Hohenschwand (rural), Freiburg and Basel. The results show that increased summer temperatures since 1925 are partly due to growing urban effect but 1947 and 1950 remain outstanding. *Subject Headings:* **1. Hot summers 2. Urban influences 3. Graz, Austria.**—*C.E.P.B.*

3.6–38 551.506.5(987)

Baird, P. D., **Canadian expedition to Baffin Island, 1950.** *Polar Record*, 6(43):372–375, Jan. 1952. map, 2 photos. **MH-BH**—Brief account includes data on ice cap, melting of snow and weather conditions. *Subject Headings:* **1. Arctic expeditions 2. Baffin Island.**

3.6–39 551.506.5(71)

Foster, L. B., **A tourist's impression of Canada's North.** *Weather*, 6(8):228–232, Aug. 1951. fig. **DWB**—Account of a flight: Nova Scotia–Resolute Bay–Goose Bay, June, 1950. *Subject Headings:* **1. Expeditions 2. Canada.**

3.6–40 551.506.5:629.13

Grocott, D. F. H., **With Aries to Alaska.** *Weather*, 7(1):6–10, Jan. 1952. 5 photos. **DWB**—Account of winds and weather on a flight in July 1951 from Iceland across geographic pole to Fairbanks, Alaska and back near magnetic pole and Iceland to England. *Subject Heading:* **1. Arctic expeditions.**

3.6–41 551.506.5(99)

Reece, Alan, **Analysis of sledge journeys.** *Polar Record*, 5(40):585–588, July 1950. table. **MH-BH**—A detailed table gives distance traveled each day, height of camp, wind direction and force, temperature, weather and state of ground for the fifth sledge journey of the Falkland Islands Dependencies Survey base at Hope Bay, Graham Coast and covers the period from Dec. 6, 1946 to Jan. 5, 1947. *Subject Headings:* **1. Expeditionary climatic data 2. Graham Coast, Antarctica.**—*M.L.R.*

3.6–42 551.506.5:551.526.8(99)

Regula, Herbert, **Eisfreie Seen in der Antarktis.** [Ice free lakes in the Antarctic.] *Umschau*, Frankfurt a.M., 50(8):247–249, April **1950.** 5 figs. **DLC** Popular report on lakes in the Atlantic region of the Antarctic explored from the air during a German Polar Expedition in 1938–1939. It is assumed that the water of these lakes is supplied by snow melting under solar radiation. Simultaneous warming of the North and South Poles in the late 1930's is attributed to extraterrestrial influences. Pictures of lakes taken during the expedition are reproduced. *Subject Headings:* **1. Antarctic expeditions 2. Antarctic lakes 3. Solar radiation 4. Antarctica.**—*G.T.*

INSTRUMENTS

(*See also items:* 3.6–65, 3.6–68, 3.6–99, 3.6–120)

3.6–43 551.507.2:551.509.31

Farquharson, J. S., **Well done, Selected Ship.** *Marine Observer*, 22(155):39–42, Jan. **1952.** 3 figs. **DWB**—Example (Sept. 12–13, 1951) of the value of ships' observations in forecasting at Dunstable. *Subject Headings:* **1. Marine Meteorology 2. Weather forecasting.**

3.6–44 551.507.2

Wetterschiffe im Nordatlantik. [Weather ships in the North Atlantic.] *Umschau*, Frankfurt a.M., 50(12):378, June **1950. DLC**—Note on the 25 specially equipped weather ships operating at 10 observation points in the North Atlantic, following an agreement between the International Meteorological Organization and International Civil Aviation Organization. Locations of observation points are shown on map and observational activities on ships are presented in two photos. *Subject Headings:* **1. Weather ships 2. North Atlantic Ocean.**—*G.T.*

3.6–45 551.508.29:551.508.54:551.584

Uhlíř, Pavel, **Thermistory pro mikrometeorologická měření.** [Thermistors for micrometeorological measurements.] *Meteorologické Zprávy*, 4(1–2):48–50, **1950.** 6 figs., 5 refs. **MH-BH**—Thermistors were formerly, used in Czechoslovakia exclusively in electronics, although there were many publications in other countries on their use in meteorology and especially microclimatology. They can be used both as thermometer and anemometer and are based on changes in electric resistance under the influence of changing heat or wind. When used as a thermometer, the thermistor is put under weak current but when used as an anemometer, it is heated up to 100–180° by a strong current. The characteristics of a thermistor are shown diagrammatically and calibration charts are presented. *Subject Headings:* **1. Thermistors 2. Hot wire anemometers 3. Microclimatology.**—*G.T.*

3.6–46 551.508.57

Naito, K., **On a method of preventing the ground-reflected wave effect in rawin observation.** *Papers in Meteorology and Geophysics*, Tokyo, 2(1):76–84, March **1951.** 10 figs., 8 refs., equations. **DWB**—The author shows that the effect of the ground-reflected waves upon rawin observations can be prevented by a conductive plane screen of knife-edge type placed in front of the receiving antenna. With the aid of the theory of the diffraction of plane electromagnetic waves by a conductive plane screen, a method is developed for determining the position and height of the screen. *Subject Heading:* **1. Rawin soundings.**—*I.L.D.*

3.6–47 551.508.71:551.508.27

Lebedeva, K. D. and Smirnov, S. A., **Pogreshnosti metoda izmereniia temperatury i vlazhnosti vozdukha psikhrometricheskimi termometrami v budke.** [Errors in measuring air temperature and humidity by psychrometric thermometers in a shelter.] *Leningrad, Glavnaia Geofizicheskaia Observatoriia, Trudy*, No. 25(87):5–19, **1951.** 5 figs., 9 tables, 4 refs. **DLC**—The author discusses the following sources of error in the measurement of air temperature by means of psychrometers in a shelter, errors arising from: 1) the position of the shelter in the testing area and from the character of the underlying surface, 2) the failure to take observations at fixed times, 3) the influence of minute variations of air temperature and

4) the effect of the color of the psychrometric shelter and of damage to the shelter. The errors in determining the relative humidity include those arising from: 1) the position of the shelter, 2) the direction and velocity of the wind and 3) the influence of the underlying surface. *Subject Headings:* **1. Psychrometers 2. Instrument shelters 3. Temperature measurement 4. Humidity measurement 5. Instrumental errors.**—*I.L.D.*

3.6–48 551.508.72

Zakrent, Stefan, **Metody pomiarow parowania wody z powierzchni gruntu.** [Methods of measurement of water evaporation from the ground surface.] *Gazeta Obserwatora PIHM*, Warsaw, 4(1):11–15, Jan. **1951.** 6 figs., table. **DLC**—Different kinds of soil evaporimeters and lysimeters (Rykaczev's, Popov's) and methods of using them are described and illustrated. *Subject Headings:* **1. Evaporimeters 2. Lysimeters 3. Evaporation measurement.** —*A.M.P.*

3.6–49 551.508.77

Bartishvilli, I. T., **K voprosu of roli "zashchity" v opredelenii osadkov.** [On the role of "shielding" in precipitation measurements.] *Meteorologiia i Gidrologiia*, No. 4:41–43, Dec. **1950.** table. **DLC**—Results of snow measurements made by the author at the high mountain meteorological station of Kazbegi (Caucasus) during 1946–1948 by means of precipitation gages of different make, with and without shields of diverse shape, are presented, tabulated and compared. The usefulness of any kind of shield is questioned. Influenced by these considerations, the author has constructed a new double precipitation gage of his own design without shields which is now being tested and which, on ground of preliminary results, seems to measure the amount of precipitation correctly in any weather. *Subject Headings:* **1. Shielded snow gages 2. Caucasus Mountains.**—*A.M.P.*

3.6–50 551.508.77:551.556

Warnick, C. C., **Laboratory and field experiments with snow gages in Idaho.** *Western Snow Conference, Proceedings*, 19th Annual Meeting, April **1951.** p. 57–68. 8 figs., 5 tables. **DWB**—The effect of wind on catch of snow gages in high mountains studied in the field and by means of wind tunnel experiments with various types of gages and shields in the Engineering Experiment Station at the University of Idaho. Equipment is amply illustrated and experimental data included for both laboratory and field tests (made in Mullan Pass and at the Priest River Experimental Forest of Idaho.) *Subject Headings:* **1. Snow gage comparisons 2. Wind effects 3. Shielded snow gages 4. Wind tunnel experiments 5. Idaho.**—*M.R.*

3.6–51 551.508.79:551.579.5

Youker, R. E. and Dreibelbis, F. R., **An improved soil-moisture measuring unit for hydrologic studies.** *American Geophysical Union, Transactions*, 32(3):447–449, June **1951.** 2 figs., 4 refs. **DWB**—A fiberglas-gypsum block soil moisture measuring unit which operates from the wilting point to saturation is illustrated and described. Calibration curves based on data obtained in experiments in Keene silt loam are also presented. The apparatus is recommended for cases where the gypsum block alone does not give satisfactory results. *Subject Heading:* **1. Soil moisture instruments.**—*M.R.*

3.6–52 551.508.96

Baruah, H. K. and Baruah, Parukutty, **A high precision ionosphere sounding equipment.** *Science and Culture*, Calcutta, 17(7):305–306, Jan. **1952.** 2 figs. **MH-BH**—Brief description is given of new radar equipment installed at the Institute of Nuclear Physics, Calcutta. The instrument is claimed to have an accuracy better than 1 km as opposed to 10 km which is declared to be the accuracy of apparatus used up to present. The instrument is being used for studies on magnetoionic splitting. Some technical details concerning the equipment are indicated and two photos of echoes presented. *Subject Heading:* **1. Radar equipment.**—*G.T.*

3.6–53 551.508.91

Barnard, A. J. and Atkinson, J. R., **The diffusion cloud chamber.** *Nature*, London, 169(4292):170–173, Feb. 2, **1952.** 8 figs., 4 refs. **DLC**—Describes a modification of Wilson's

cloud chamber in which permanent supersaturation is obtained by diffusion from a hot to a cold plate. Operation at Glasgow and some electron photos are described. *Subject Heading:* **1. Cloud chambers.**—*C.E.P.B.*

3.6–54 551.508.952:551.510.534

Neves, Leonel, **Medições do ozone atmosférico e sen interesse meteorológico.** [Measurement of atmospheric ozone and its meteorological significance.] Lisbon, March **1951.** 14 p. equations. Mimeographed. **DWB**—A description of apparatus used to measure atmospheric ozone, and analyses of the observations made with this instrument, of the calculations and of the relationship between atmospheric ozone and meteorological conditions. *Subject Headings:* **1. Ozone measurement 2. Spectrophotometers. I. Portugal. Serviço Meteorologico Nacional.**—*I.L.D.*

SYNOPTIC ANALYSIS AND FORECASTING

(*See also items:* 3.6–43, 3.6–148)

3.6–55 551.509:621.396

Bell, E. J., **Radio communication applied to meteorology.** *Marine Observer*, 21(153):180–188, July **1951.** 3 figs. **DWB**—After a brief history of radio communication at sea (with photos of Burnham radio station), the application of radio to synoptic broadcasts, weather reports to and from ships, and use of teleprinters is described. *Subject Headings:* **1. Weather forecasting 2. Radio communication.**—*C.E.P.B.*

3.6–56 551.509.31

§Rafałowski, Stanisław, **Jak powstaje prognoza meteorologiczna (pogody).** [How are synoptic weather forecasts made?] *Gazeta Obserwatora PIHM*, Warsaw, 3(9):8–10, Sept. **1950.** fig., synoptic chart. **DLC**—The techniques of weather forecasting, from start to finish, are explained in a concise manner. *Subject Headings:* **1. Synoptic forecasting 2. Poland.** —*A.M.P.*

3.6–57 551.509.312

Hinkelmann, K., **Dreidimensionale Probleme der numerischen Wettervorhersage.** [Three-dimensional problems of numerical weather forecasting.] *Meteorologische Rundschau*, 4(11/12):210–213, Nov./Dec. **1951.** 6 refs., 15 equations. **DWB**—After a discussion of the precalculation of the 500 mb surface at Princeton (*see item* No. 2.8–35 in Aug. 1951 *Meteorological Abstracts*), the neglected vertical velocity is introduced. The resulting equation is very complex but could perhaps be solved by special calculating machines. *Subject Heading:* **1. Mathematical forecasting.**—*C.E.P.B.*

3.6–58 551.509.33

Brádka, Jan, **Pětidenní předpovědi počasí vydávané Americkou povětrnostní službou.** [Five-day forecasts published by the American meteorological service.] *Meteorologické Zprávy*, 4(1–2):37–41, **1950.** 5 figs. **MH-BH** In 1940 a method was established in the U. S. A. for working out 5-day forecasts. This method was applied on a large scale and a number of publications were issued on the subject. Only a small fraction of these publications reached Czechoslovakia, including, however, "Methods of Extended Forecasting" by Jerome Namias, a synopsis of developments in 5-day forecasting up to 1943. Most of the material for this article is taken from the above mentioned booklet and the charts and tables are reproduced. The method is based on synoptic charts representing 5-day averages of pressure at various latitudes and heights. Although a small state cannot afford the organization required for preparing such charts, some of the methods could be applied in Czechoslovakia. *Subject Headings:* **1. Extended forecasting I. Namias, Jerome.**—*G.T.*

3.6–59 551.509.33:551.524.37

*Karapiperis, Phōtios P., **Taxinomēsis tōn cheimōnōn en H Athēnais tēs periodon 1859 1949.** [Classification of the winters in Athens in the period 1859–1949.] *Akademia Athenon*,

Praktika, 25:42–47, **1950.** tables, refs. In Greek, English summary p. 47. Abstracted from reprint. **DWB**—Mean and extreme temperatures and percentage frequency of high maxima and low minima are presented in tables for 39 winters chosen from a 90-year period. A classification of winters into 5 groups, based on long period averages, shows that the probability of occurrence is 4% for rigorous, 17% for cold, 1% for very mild, 21% for mild and 57% for normal winters. *Subject Headings:* **1. Severe winters 2. Long range forecasting 3. Long period records 4. Athens, Greece.**—*G.T.*

3.6–60 551.509.33:551.513

Pogosian, KH. P. and Savchenkova, E. I., **O chislovom vyrazhenii vida atmosfernoi tsirkuliatsii.** [The quantitative representation of an atmospheric circulation type.] *Meteorologiia i Gidrologiia*, No. 3:5–13, Nov. **1950.** 6 figs., 3 tables, 6 refs. **DLC**—The freezing and thawing of rivers can be predicted by determining the probability of the persistence of a particular type of a given atmospheric circulation and the probability of its transformation into another type. For European U.S.S.R., four types of atmospheric circulation (southeast type and three types of meridional circulation) are described. A method for describing numerically the characteristics of these circulation types is developed and the index of circulation is given by the equation: $I = H_1 - H_2$, where H_1 and H_2 are the respective geopotentials of the regions into which European U.S.S.R. is divided arbitrarily. *Subject Headings:* **1. Extended forecasting 2. General circulation 3. U.S.S.R.**—*I.L.D.*

3.6–61 551.509.34

Burgess, C. R., **Local weather. Pts. I and II.** *Weather*, 6(5,6):144–148, 163–166, May, June **1951.** 3 figs. **DWB**—Pt. I discusses the effects of radiation and topography in modifying regional weather. Includes effect of radiation on diurnal variation of wind, of land and sea breezes (e.g., on diurnal temperature wave on east coast of Billiton) emphasized by mountain and valley winds, effect on cloud and fog. Pt. II is a brief account of effect of topography on wind (deflection and canalizing by hills), minimum temperature, cloud, rainfall and fog. *Subject Headings:* **1. Weather forecasting 2. Topographic effects 3. Radiation.**—*C.E.P.B.*

STRUCTURE AND PHYSICS OF THE ATMOSPHERE

STRUCTURE OF THE ATMOSPHERE

(*See also items:* 3.6–27, 3.6–54)

3.6–62 551.510.41:546.17:631.41

Adel, Arthur, **Atmospheric nitrous oxide and the nitrogen cycle.** *Science*, 113(2944):624–625, June 1, **1951.** 11 refs. **DWB** The author summarizes the evidence for the hypothesis that atmospheric nitrous oxide originates in the soil and that it is a phase of the nitrogen cycle. *Subject Headings:* **1. Atmospheric composition 2. Nitrogen compounds 3. Nitrogen cycle.**—*I.L.D.*

3.6–63 551.510.41:551.574.1

Boyce, Steve G., **Source of atmospheric salts.** *Science*, 113(2944):620–621, June 1, **1951.** 10 refs. **DWB**—The author reviews briefly various proposed suggestions of the manner in which atmospheric salts are derived from the ocean and describes experiments on the measurement of the landward movement of salts. Evidence indicates that the majority of air-borne droplets carrying salt originated from bursting bubbles of the swash and spume. *Subject Heading:* **1. Saline nuclei.**—*I.L.D.*

3.6–64 551.510.42:551.574.1

Junge, Christian, **Das atmosphärische Aerosol.** [The atmospheric aerosol.] *Umschau*, Frankfurt a.M., 51(21):647–649, Nov. **1951.** 2 figs., ref. **DLC**—Frequency and size distribution of aerosol particles of different origin are investigated and presented in graphs. Maritime aerosols furnish more than one third of the total quantity of aerosols. Most of the larger particles, even over South and Central Germany, during invasion of Atlantic air masses, are sea salt. Some aspects of cloud and precipitation formation are briefly mentioned and the

author also refers to possibilities of artificial nucleation of clouds and experiments undertaken in that field by American scientists. *Subject Headings:* **1. Aerosols 2. Saline nuclei 3. Condensation nuclei.**—*G.T.*

3.6–65 551.510.42:551.508.92:551.591

Steffens, Carsten and Rubin, Sylvan, **Visibility and air pollution.** *National Air Pollution Symposium, Proceedings*, Nov. 10–11, **1949.** p. 103–108. 5 figs., 3 tables, 9 refs., 16 equations. **DWB**—The measurement of the attenuation coefficient described consists of photographing a portion of the landscape and measuring on the negative the relative optical densities of specified images which may be either two black objects a known distance apart along the same path or a black object at a known distance from the adjoining horizon. The equations for determining the attenuation coefficient by these methods are derived. Equations for deriving the attenuation coefficient at different wave lengths are also developed. The visibilities obtained by measurement of attenuation coefficient for Los Angeles under various atmospheric conditions are presented. *Subject Headings:* **1. Atmospheric pollution 2. Visibility measurement techniques 3. Los Angeles, California.**—*I.L.D.*

3.6–66 551.510.42:58

Thomas, Moyer D., Hendricks, Russel H. and Hill, George R., **The action of sulphur dioxide on vegetation.** *National Air Pollution Symposium, Proceedings*, Nov. 10–11, **1949.** p. 142–147. 8 figs., table, 4 refs. **DWB**—The time-concentration relationships used for exposure of animals to toxic agents are valid for the action of SO_2 upon alfalfa. The sensitivity of alfalfa to SO_2 is found to increase with increasing relative humidity; plants are more sensitive to the gas in sunlight than in shade; their sensitivity is least early in the morning, rises to a maximum at midmorning and then declines. The effect of SO_2 on yield of alfalfa and the effect of sublethal doses are discussed. *Subject Headings:* **1. Atmospheric pollution 2. Sulphur dioxide 3. Vegetation 4. Animals.**—*I.L.D.*

3.6–67 551.510.5:06

Kellogg, W. W., Crary, A. P., Whipple, Fred L., Spitzer, Lyman, Jr. and Wulf, Oliver R., **Report of the standing committee on problems of the upper atmosphere.** *American Geophysical Union, Transactions*, 32(5):755–759, Oct. **1951.** 12 refs. **DWB**—This first report of a new committee of the American Geophysical Union covers the fields of sound propagation, meteors, theoretical problems of the ionosphere and exosphere and the relationship between upper atmospheric circulation and the geomagnetic field. Research work carried on in these fields in the United States and other countries is mentioned and results indicated and discussed. Names of the 10 committee members are listed. It is pointed out that the committee plans to issue a similar report every year. *Subject Headings:* **1. Upper atmosphere research 2. American Geophysical Union. Committee on Problems of the Upper Atmosphere.**—*G.T.*

3.6–68 551.510.5:551.507.362

Ley, Willy, **Upper atmosphere, its exploration and exploitation.** *Aeronautical Engineering Review*, 10(2):20–24, 30, Feb. **1951.** photos, diagrs., graphs, table. **DLC**—Flight paths of various types of rockets, including one to an approximate antipodal point with a maximum height of over 155 miles, are described and analyzed in tables and diagrams. The author concludes that the region between about 11 miles and 25 miles, too high for "air-breathing" engines and too low for rockets, seems to elude exploration. Photographs and drawings of rockets and a table showing pressure recordings made by two different rockets up to an altitude of 66,930 ft are presented. *Subject Headings:* **1. Upper atmosphere research 2. Rocket instrumentation.**—*G.T.*

3.6–69 551.510.5:001

Nomenklatur der Erdatmosphäre. [Nomenclature of the earth's atmosphere.] *Umschau*, Frankfurt a.M., 51(17):521, Sept. **1951.** **DLC**—A table lists terms connected with the various layers of the atmosphere as suggested by H. Flohn and R. Penndorf in the March and April 1950 issues of the *A.M.S. Bulletin* under the title "The stratification of the atmosphere"

(*see item* No. 6–30 in June 1950 *Meteorological Abstracts.*) *Subject Headings:* **1. Atmospheric structure 2. Definitions.**—*G.T.*

UPPER ATMOSPHERE—IONOSPHERE

3.6–70 551.510.534:523.38

Paetzold, H. K., **Die durch die atmosphärische Ozonschicht bewirkte Färbung des Erdschattens auf dem verfinsterten Mond.** [The coloration of the earth shadow on the eclipsed moon by the atmospheric ozone layer.] *Naturwissenschaften*, 38(23):544–545, Dec., **1951.** 2 figs., 6 refs. **DLC**—In a lunar eclipse there is a greenish band a few minutes wide passing through grey to the rust-red of most of the moon. The green zone is attributed to selective absorption around 6000 Å, compared with 5000 Å of rays passing tangentially through the ozone layer. With much or concentrated ozone, color is blue-green; with less ozone, yellow-green. *Subject Headings:* **1. Lunar eclipses 2. Ozone layer.**—*C.E.P.B.*

3.6–71 551.510.535

McNicol, R. W. E. and Gipps, G. de V., **Characteristics of the E_s region at Brisbane.** *Journal of Geophysical Research*, 56(1):17–31, March **1951.** 10 figs., 10 refs. **DWB**—A study based on routine h'f records of the E_s layer taken at Brisbane, Australia, between June 1943 and Dec. 1949 shows at all seasons the critical frequency is lowest at dawn. In summer it reaches a maximum at 10 hr and declines gradually. In winter the rise is slower and the maximum occurs around 14 hr, dropping markedly by sunset. The observations suggest that there are 2 distinct types of E_s at Brisbane—one found at great heights and descending to its final position, the other formed *in situ*. The first is predominant in summer and the second in winter. No evidence of correlation could be found with sunspot numbers, ionospheric storms or meteor occurrence frequency, and the conclusion is reached that the Brisbane E_s is not predominantly of meteoric origin. There is some slight evidence of correlation between the constant height type of E_s and F region diffuseness. *Subject Headings:* **1. E layer 2. Ionospheric variations 3. Brisbane, Australia.**—*From author's abstract.*

3.6–72 551.510.535:551.557

Yerg, Donald G., **Ionospheric wind systems and electron concentrations of the F layer.** *Journal of Meteorology*, 8(4):244–250, Aug. **1951.** 7 figs., table, 8 refs. **MH-BH**—Values of the kinematic viscosity η/ρ were calculated for 0, 10, 50, 100, 150, 200, 250 and 300 km altitude, and the values agree in the lower levels with similar data based on SUTHERLAND's formula (depending on temperature). Extrapolation of data in layer thickness versus mean free path indicates that beyond 400 km viscous effects decrease, so that a maximum of viscous action occurs below that level (perhaps at 200 km). A model is proposed for circulation in the stratosphere based on observed lapse rates, calculated winds and this study of viscous stresses. Slipping is thought to occur about 200 km, yielding east winds at all latitudes. Effects on ion concentration explain observed longitudinal variations in F_2 layer. *Subject Headings:* **1. Ionospheric winds 2. Electron density 3. F layer.**—*M.R.*

3.6–73 551.510.535:523.88

Mills, B. Y. and Thomas, A. B., **Observations of the source of radio-frequency radiation in the constellation of Cygnus.** *Australian Journal of Scientific Research, Ser. A, Physical Sciences*, 4(2):158–171, June **1951.** 3 figs., plate, 3 tables, 2 equations. **MH-BH**—The position and some of the properties of the source of radio frequency radiation in Cygnus have been determined. The observed fluctuations in intensity have been found to correlate with activity in the F region of the ionosphere. There is no evidence that the emission from the source varies. *Subject Headings:* **1. Radio frequency radiation 2. Stellar radiation 3. F layer 4. Ionospheric variations.**—*From author's abstract.*

3.6–74 551.510.535:551.594.7

Scott, James C. W., **The gyro-frequency in the Arctic E-layer.** *Journal of Geophysical Research*, 56(1):1–16, March **1951.** 7 figs., 4 tables, 8 refs., 15 equations. **DWB**—Calculation of the gyro-frequency in the E layer at Canadian Arctic ionospheric recording stations gives a

lower magnetic field than that obtained by extrapolation of the terrestrial field measured at ground level, and at one station (Resolute Bay) a large semidiurnal variation with maxima at 06 and 18 hr local time. Ray path deflections which can explain similar effects previously reported for the F layer cannot be responsible in the E layer because of the opposite sense of this deviation and because of the small layer-thickness. Moreover, no semi-diurnal variation was found in the F layer. It is shown that these new W layer phenomena may be due to a variable concentration of heavy ions rising to over 4000 times the density of free electrons. *Subject Headings:* **1. E. layer 2. Radio propagation 3. Ionospheric variations 4. Canadian Arctic.**—*From author's abstract.*

3.6–75 551.510.535:551.557

Winds and turbulence in the upper atmosphere. *Nature*, London, 167(4251):626–628, April 21, 1951. table. **DLC**—An account of the Geophysical discussion at the Royal Astronomical Society on Feb. 23. Mainly describes radio methods but P. A. SHEPPARD discussed the meteorology, suggesting that the high velocities reported (drifts up to 100 m/sec at heights of 250–300 km) were probably due to quasi-geostrophic flow in different directions at different levels. *Subject Headings:* **1. Turbulence effects 2. Upper air winds.**—*C.E.P.B.*

MECHANICS AND THERMODYNAMICS OF THE ATMOSPHERE

(*See also item:* 3.6–4)

3.6–76 551.511:551.524.7:551.557:551.513

†Kellogg, William W. and Schilling, Gerhard F., **A proposed model of the circulation in the upper stratosphere.** *Journal of Meteorology*, 8(4):222–230, Aug. **1951.** 4 figs., 3 tables, 47 refs. **MH-BH**—Model is based on observation of wind (7 sources are listed), on temperature distribution (8 sources) and on 4 miscellaneous considerations (ozone distribution, total oscillation, dynamo theory and radiative equilibrium). In addition to elaborate schematic diagrams showing temperature between isobaric surfaces (0–120 km) for all latitudes and a comparison between summer and winter temperature profile, a schematic representation of the circulation (wind direction, force and nature of flow) is given for the same cross section 90°N–90°S, and 0–120 km height. *Subject Headings:* **1. General circulation 2. Stratospheric circulation 3. Temperature of the stratosphere 4. Upper air winds.**—*M.R.*

3.6–77 551.511:551.543

Lingelbach, E., **Advektion und Luftdrucktendenz.** [Advection and pressure tendency.] *Meteorologische Rundschau*, 4(11/12):209–210, Nov./Dec. **1951.** 2 figs., 4 refs., 17 equations. **DWB** An attempt to introduce advective (ageostrophic) vectors into the equations of pressure tendency, illustrated by computations of the field of $\partial p/\partial t$ in a warm sector cyclone. *Subject Headings:* **1. Advection 2. Pressure fields.**—*C.E.P.B.*

3.6–78 551.511:551.513.1

Long, Robert R., **A theoretical and experimental study of the motion and stability of certain atmospheric vortices.** *Journal of Meteorology*, 8(4):207–221, Aug. **1951.** 13 figs., table, 15 refs., 74 equations. **MH-BH**—An attempt was made to simulate in the laboratory the conditions occurring in the earth's atmosphere with respect to the movement and stability of polar vortexes when a denser fluid covers the polar region. This study continues the work of FULTZ (*see item* No. 3–43 in March 1950 *Meteorological Abstracts*) with a rotating spherical shell apparatus. The general equations of motion are solved to provide a theory for the motion of this vortex with consideration of the Coriolis force. This theory is first applied to motion in an environment of uniform vorticity, and then in an environment at rest with respect to the earth. Visual and photographic observations were made and are presented in figures and tables. Comparison is also made graphically between theoretical and observed motions of the vortexes. *Subject Headings:* **1. Polar vortexes 2. Rotating spherical shells 3. Dynamics of the atmosphere.**—*M.R.*

3.6–79 551.511

McVittie, G. C., **Coordinate systems in dynamic meteorology.** *Journal of Meteorology*, 8(3):161–167, June **1951.** 2 figs., 5 refs., 36 equations. **DWB**—The paper contains a general

survey of the methods of setting up coordinate systems in dynamic meteorology and a descrip tion of certain systems derived from geometric considerations. Equations of motion an continuity are given explicitly, and general formulas for the divergence and rate of change o vorticity are listed. Spherical polar coordinates lead to the introduction of intrinsic coordinat systems, in which the atmospheric motion itself defines the coordinate system. A brie discussion is devoted to the relationship between the size of an atmospheric motion and th coordinate system which best describes it, to gradient and geostrophic winds, and to th Rossby formula for potential vorticity. *Subject Headings:* **1. Dynamic meteorology 2 Coordinate systems.**—*Author's abstract.*

3.6–80 551.511:551.55

Panofsky, Hans and Crutcher, Harold L., **Horizontal momentum flux due to small-scal turbulence.** *Journal of Meteorology*, 8(6):420–421, Dec. **1951.** 2 figs., 3 refs. **MH-BH**— Deviations of 10-sec average N and E components at a height of 109 m at Brookhaven, Nev York, from trend smoothed over an hour, were horizontally isotropic and gave values of me ridional flux of zonal momentum negligible compared with large scale flux. *Subject Heading* **1. Eddy flux 2. Momentum transfer 3. Atmospheric turbulence.**—*C.E.P.B.*

3.6–81 551.51

Perkins, D. T. and Gustafson, A. F., **Differential relations between quantities projecte from meteorological surfaces.** *Journal of Meteorology*, 8(6):418–420, Dec. **1951.** 3 refs 13 equations. **MH-BH**—The equations generalize projections from one arbitrary surface t another (e.g., constant pressure-constant height). They are used to derive equations of therma wind, divergence and vorticity. *Subject Heading:* **1. Dynamics of the atmosphere.**—*C.E.P.B*

3.6–82 551.511:551.513.

White, Robert M., **On the energy balance of the atmosphere.** *American Geophysica Union, Transactions*, 32(3):391–396, June **1951.** fig., 2 tables, 9 refs., 4 equations. **DWB**— The net radiative energy surplus or deficit of the atmosphere in middle and high latitudes i inferred from a consideration of energy transport processes in the atmosphere. Results ar shown to be consistent with estimates made through direct consideration of the radiativ processes, thus providing an independent check on them. Calculations by Albrecht, Hough ton, Gabites and White for 5 latitude belts are compared. *Subject Headings:* **1. Energ balance 2. Energy transport.**—*From author's abstract.*

3.6–83 551.511:551.524.7:551.55

Winston, Jay S., **Evaluation of advective eddy term over New England for January 194** U. S. Weather Bureau, July **1951.** 4 p. 4 equations. **DWB**—An attempt is made to deter mine the source of heating in New England in January 1945 as discussed by Aubert an Winston, *Journal of Meteorology*, April 1951 (*see item* No. 2.11–69 in Nov. 1951 *Meteorologica Abstracts*). Condensation accounts for 23 out of the 52 units, but the remaining 29 unit could possibly be accounted for by downward motion and consequent dynamical warming o air or by eddy advection. The theory is briefly presented and calculations made, showin that the eddy term, $-K\overline{V_2' \cdot \nabla_2 T'}$, when added to the heat of condensation could nearly bal ance the mean horizontal heating. Thus, large scale eddies which are smoothed out on monthl mean charts bring additional heat into a region such as New England from the warm wate areas offshore. *Subject Headings:* **1. Thermodynamics of the atmosphere 2. Eddy advectio of heat 3. New England. I. U. S. Weather Bureau II. Aubert, Eugene J.**—*M.R.*

GENERAL CIRCULATION

(*See also items:* 3.6–7, 3.6–76, 3.6–78, 3.6–82)

3.6–84 551.513.2:551.501.

James, R. W., **A February cross-section along the Greenwich meridian.** *Meteorologica Magazine*, London, 80(954):341–346, Dec. **1951.** 3 figs., table, 3 equations, 6 refs. **MH-BH**— Author constructed meridional profiles of geostrophic W. wind component at pressure leve

850–200 mb based on $1.06(\Delta Z/\Delta \cos \phi)$ m/sec, Z = contour height of pressure level. Profiles for 850 and 300 mb shown, also isopleths of mean zonal wind velocity showing a mean jet in 40°N, 300–200 mb. Results compared with N. America and China. *Subject Headings:* **1. Zonal circulation 2. Wind profiles.**—*C.E.P.B.*

3.6–85 551.513.2:551.515.8:551.524.7(265)

Jones, John J., **The physical cause of the jet stream in the Japanese area.** *U. S. Air Force 2143D Air Weather Wing Technical Bulletin*, 1(7):4–21, June 1951. 15 figs., 6 equations. **DWB**—A lucid, qualitative attempt to explain the jet stream as the effect of temperature distribution brought about by the development of a cyclone on a frontal surface separating two air masses. Author's conclusion is based upon a study of the mean temperature distribution both horizontally and in a meridional plane in the western Pacific and upon the relationship between temperature distribution and wind field. *Subject Headings:* **1. Jet stream 2. Atmospheric circulation 3. Upper air temperatures 4. Western Pacific 5. Japan.**—*I.L.D.*

3.6–86 551.513.2 551.557

Radok, Uwe and Grant, Alison M., **A note on cross section technique.** *Weather Development and Research Bulletin*, Melbourne, No. 17:39–38, Aug. 1951. 2 tables, equations. **DWB**—Since the accuracy of geostrophic winds, which are determined from aerological cross sections, depends on the accuracy of the slope of the constant pressure surfaces, it is only possible to obtain accurate estimates for the Australian area if the contours are nearly straight and are running in a West-East direction. Smoothing techniques introduce further inaccuracy. This can be somewhat reduced by use of potential temperature and by drawing isentropes at 5° intervals and by following other simple rules, which are set forth for determining the entire velocity field for meridional cross sections. *Subject Headings:* **1. Aerological cross sections 2. Geostrophic winds 3. Isentropic analysis 4. Australia.**—*M.R.*

ATMOSPHERIC DISTURBANCES

(*See also item:* 3.6–85)

3.6–87 551.515:551.578.4(99)

§Lamb, H. H., **South polar atmospheric circulation and the nourishment of the Antarctic ice-cap.** *Meteorological Magazine*, London, 81(956):33–42, Feb. 1952. 4 figs., 12 refs. **DWB**—Southern Hemisphere surface maps March 18–25, 1947, and cross section show that Antarctic anticyclones are weak and alternate with cyclonic situations. Anticyclones of March 17 and 20–21 were warm and of dynamic origin. Author infers that frontal and cyclonic situations provide the snowfall on the ice cap; frequency of fronts and tracks of depressions charted. *Subject Headings:* **1. Snow mechanics 2. Synoptic analysis 3. Antarctica.** *C.E.P.B.*

3.6–88 551.515.12(437)

§Konček, Mikuláš, **Vpád pevninského tropického vzduchu z oblasti Arábie a Malej Azie do východnej polovíny Strednej Europy v dňoch 20. až 22. apríla 1950.** [Invasion of continental tropical air from Arabia and Asia Minor into the eastern half of Middle Europe on April 20 to 22, 1950.] *Meteorologické Zprávy*, 4(5–6):104–106, **1950.** 5 figs. In Slovak. **MH-BH**—The development of a synoptic situation is reported with particular attention to its effect on the weather in Czechoslovakia, the most spectacular feature being an unusually high temperature with readings up to 29°C. Overall synoptic charts are presented in support of the case history. *Subject Headings:* **1. Heat waves 2. Synoptic studies 3. Slovak language 4. Czechoslovakia.**—*G.T.*

3.6–89 551.515.12

†McCaffery, W. D. S., **Unexpected fair weather over southern Scotland, March 10, 1951.** *Meteorological Magazine*, London, 80(954):346–351, Dec. 1951. 3 figs. **MH-BH**—Fine weather over S.W. Scotland and N.W. England in a depression moving SSW across Scotland is attributed to a shallow "bubble" of cold dry air detached from a reservoir of such air near Iceland. *Subject Headings:* **1. Depressions 2. Scotland 3. England.**—*C.E.P.B.*

3.6–90 551.515.3

Brooks, Edward M., **Tornadoes and related phenomena.** (In: **Compendium of meteorology.** Boston, American Meteorological Society, **1951.** p. 673–680. 25 refs.) **DWB**—A general article summarizing (mostly for the United States) frequency, association with intense cyclones, preliminary signs and associated weather, structure (greatest observed pressure fall 200 mb, estimated winds up to 300 m.p.h.). Discusses physics of pendant cloud and dust column, tracks (90% from between S. and W.) and speed. Theories of generation and maintenance are considered, no final conclusion possible. Fatalities, damage and protection summarized. Dust devils and waterspouts are briefly dealt with. *Subject Heading:* **1. Tornadoes.** —*C.E.P.B.*

3.6–91 551.515.8

§Godson, Warren L., **Synoptic properties of frontal surfaces.** *Royal Meteorological Society, Quarterly Journal,* 77(334):633–653, Oct. **1951.** 11 figs., 17 refs., 18 equations. **MH-BH**—The mathematical consequences of a first-order temperature discontinuity at a front are developed from the fields of pressure, temperature and geostrophic wind. These results are applied to determine the correct construction of synoptic charts in the vicinity of fronts, and to determine criteria for obtaining the boundary levels of frontal surfaces, as well as their orientations and slopes. Techniques for qualitative and quantitative evaluation of vertical motions of fronts are also presented. These concepts, and analytical methods based on them, are illustrated by reference to the synoptic situation over North America on 4 April 1950. Particular attention is paid to the structure of occluded frontal waves, their three-dimensional analysis and representation. *Subject Headings:* **1. Frontal structure 2. Synoptic analysis.**—*Author's abstract.*

3.6–92 551.515.8(234.3)

§Hoinkes, Herfried, **Frontenanalyse mit Hilfe von Bergbeobachtungen.** [Frontal analysis with the help of mountain observations.] *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. A,* 4:238–262, **1951.** 20 figs., 4 tables, 9 refs. German, English and French summaries p. 238–239. **DWB**—Cold fronts over the Alps on Sept. 28, 1940 are analyzed by numerous observations at mountain stations and upper air ascents in Central Europe, giving profiles and potential temperatures. As it approached the crest of the Alps, modified polar air formed a wedge at 1200–2000 m, far outrunning the front on low ground, but the main fresh mP mass had a nearly vertical front. On passing the crest from N. to S. these conditions tended to be reversed. Some marked irregularities are accounted for by local föhn effects. *Subject Headings:* **1. Cold fronts 2. Alps.**—*C.E.P.B.*

RADIATION AND TEMPERATURE

RADIATION

(*See also items:* 3.6–29, 3.6–98, 3.6–185)

3.6–93 551.521.1:621.47(04)

Parczewski, Władysław, **Promieniowanie słoneczne w służbie człowieka.** [Solar radiation in the service of man.] *Gazeta Obserwatora PIHM,* Warsaw, 4(3):5–7, March **1951.** fig., 2 tables. **DLC**—A popular article on solar radiation and the possibility of catching and utilizing solar heat. Solar furnaces constructed by the Soviet scientist K. G. Trofimov in 1929 and recent utilization of his inventions ("solar boilers and distillers") are described. *Subject Headings:* **1. Solar radiation 2. Solar furnaces 3. Popular meteorology 4. Trofimov, K. G.**—*A.M.P.*

3.6–94 551.521.11:677

Sippel, A., **Textilien und Sonnenlicht.** [Textiles and sunlight.] *Umschau,* Frankfurt a.M., 51(18):554–556, Sept. **1951.** 3 figs., 4 refs. **DLC**—The destructive chemical effect of natural and artificial radiation and humidity on textiles is discussed and data on the decline in resistance of various fabrics after a half-year's exposure to weather influences presented. Methods for increasing the weather resistance of textiles, such as eliminating vulnerable

components and conditioning with certain chemical treatments, are mentioned in general terms. A photograph of an instrument for experimental sun exposure of textiles is included. *Subject Headings:* **1. Weathering of materials 2. Sunshine.**—*G.T.*

3.6–95 551.521.313

Aldrich, L. B., **Sonnenobservatorium Montezuma (Chili).** [Solar observatory at Montezuma (Chile).] *Naturwissenschaftliche Rundschau*, 4(9):398–399, Sept. **1951. DWB** – A brief account of measurements of the solar constant. An increase of 0.25% occurred between 1925 and 1945. *Subject Headings:* **1. Solar constant 2. Montezuma Observatory, Chile.**—*C.E.P.B.*

3.6–96 551.521.13:06

Smithsonian Institution. Astrophysical Observatory, **Report on the Astrophysical Observatory for the year ended June 30, 1950.** *Smithsonian Institution, Annual Report* for 1950, p. 116–121, **1951.** Abstracted from reprint. **DSI**—Division of Astrophysical Research was mainly concerned with pyrheliometry; an increase of 0.25% in solar constant is reported between 1925 and 1944. Department of Radiation and Organisms dealt with reorganization of laboratory facilities for experiments on plants. *Subject Headings:* **1. Astrophysical observatories 2. Smithsonian Institution.**—*C.E.P.B.*

3.6–97 551.521.32

†London, Julius, **Study of the atmospheric heat balance.** New York University, College of Engineering, Research Division, Contract AF 19(122)-165, Progress Reports, 1, 2/3, 4, March–Dec. **1950.** 3 pieces. graphs, tables, biblio. **DWB**—First an atmospheric model was made to show the vertical distribution of temperature, pressure, relative humidity and cloudiness, and the height of the tropopause, with latitude during March. Then the infrared radiation balance was calculated for clear and cloudy skies, based on the above model. The average infrared cooling per day in the troposphere (0°–70°N) for March is shown graphically (for surface to 10–16 km) for clear and cloudy skies. Next the absorption by ozone, CO_2 and water vapor is calculated and various theories and difficulties discussed. A good bibliography and a translation of a paper by G. YAMAMOTO "On nocturnal radiation" (*Met. Soc. of Japan, Journal*, 28(1), 1950. *See item* No. 2.2–82 in Feb. 1951 *Meteorological Abstracts*) are included in a supplement. *Subject Headings:* **1. Heat balance 2. Radiation balance 3. Infrared radiation 4. Nocturnal radiation 5. Atmospheric absorption 6. Translations. I. New York University. College of Engineering. Research Division II. Contract AF19(122)-165 III. Yamamoto, Gi-ichi IV. Emy, Robert** (*trans.*).—*M.R.*

3.6–98 551.521.4:551.521.61:535.33

†*Dufay, Jean, **Bandes d'émission des molécules OH et O_2 dans le spectre du ciel nocturne, entre 9000 et 11000 Å.** [Bands of emission of OH and O_2 molecules in the spectrum of the night sky between 9000 and 11000 Å.] *Annales de Géophysique*, 7(1):1–8, Jan.–March **1951.** 3 tables, 23 refs. **MH-BH**—Recent work by many authors, in the field of spectroscopy of the visible or near infrared ($\lambda < 9000$ Å), is summarized and applied to the calculation of the position of origin of the OH molecule. Work by MEINEL in the region 9000–11000 Å is also analyzed. The probable structure of rotation of these bands is predicted and compared with observations of KRASSOVSKY, and it is shown that the 5 predicted bands are present in the light of the night sky. Also O_2 formed by recombination emits radiation between 9000 and 11000 Å. *Subject Headings:* **1. Light of the night sky 2. Infrared radiation 3. Spectroscopy.** –*M.R.*

3.6–99 551.521.4:551.593.55:551.508.93

Geo-Science, Inc., Washington Grove, Maryland, **Twilight and airglow study.** Contract 19(122)-433, Reports Nos. 1–2, May 1 and Aug. 1, **1951.** diagrs., graphs, tables, biblio. **DWB**—In Report No. 1, the purpose and scope of the project is outlined: namely, to obtain and analyze data on brightness of zenith twilight and night sky near Washington, D. C., in order to determine upper atmospheric temperatures and densities, diurnal and seasonal variations in airglow intensity and heights, and the effect of moon phase or cloudiness on brightness values. Equipment is described and wiring diagrams shown. Report No. 2 gives a survey of

literature, translations of a Russian and a French article on light of night sky, and hourly mean values for July, 1951 for Washington, D. C., along with typical traces. *Subject Headings:* **1. Light of the night sky 2. Zenith twilight 3. Upper atmosphere research. I. MacKenzie, Merlin H. II. Yerg, Donald G. III. Iudalevick, F. F. IV. Barbier, Daniel V. Contract 19(122)-433.**—*M.R.*

3.6–100 551.521.64:551.583.3:551.311.13

Bergold, O., **Kosmische Dunkelwolken Urheber der Eiszeit.** [Dark cosmic clouds as cause of the glacial period.] *Umschau*, Frankfurt a.M., 49(18):568, Sept. **1949.** 5 refs. **DLC**—Earlier theories regarding the origin of the glacial period are discussed and SHAPLEY's interpretation, recently re-introduced by K. HIMPEL, explained. The theory is based on the effect of cosmic dark clouds on solar radiation. It is pointed out that scientists have not yet accepted this hypothesis. *Subject Headings:* **1. Cosmic clouds 2. Climatic changes 3. Glacial periods.**—*G.T.*

3.6–101 551.521.64:551.501.7

Ferrand, P., Morellet, D. and Bousser, F., **Technique de ballons-sonde groupes pour l'étude du rayonnement cosmique en haute atmosphère.** [Cluster balloon sonde technique for the study of cosmic radiation in the upper atmosphere.] *Annales de Géophysique*, 6(3):217–224, July–Sept. **1950.** 4 figs., 3 photos, equations. **MH-BH**—At elevations of 20,000 meters, at which primary cosmic radiation can be studied more precisely, special problems are encountered in the use of photographic plates with thick emulsions, in the use of cluster balloons and of electronic devices. The author describes: 1) a method of maintaining a constant temperature for the photographic plates; 2) radiosonde technique and goniometric locations and 3) the release of clusters of balloons. *Subject Headings:* **1. Cosmic radiation 2. Upper air observation techniques 3. Balloons 4. Photometry.**—*I.L.D.*

3.6–102 551.521.64

Iona, Mario, Jr., **Correlation of meteorological parameters with cosmic ray data.** Denver, University, Dept. of Physics, Contract AF 19(122)-54, Report No. 7, Dec. 31, **1950.** 12 p. 6 refs. **DWB**—A summary of work done in the preceding 3 months in the modification of equipment as a result of preliminary observation. Previous work under this contract since April 15, 1950 consisted of a review of literature on subject, theoretical consideration of magnitude of meteorological effects (temperature changes, humidity, etc.) on meson intensities at different altitudes, design of recording equipment, counter telescope for balloon-borne equipment and 3 months' operation of equipment at Echo Lake and Mt. Evans. *Subject Headings:* **1. Cosmic radiation research 2. Mt. Evans, Colorado. I. Denver. University. Dept. of Physics II. Contract AF19(122)-54.**—*M.R.*

3.6–103 551.521.7:616.1

Sarre, Hans, **Solare Einflüsse auf die Takata-Reaktion.** [Solar influences on the Takata reaction.] *Annalen der Meteorologie, Medizin-meteorologische Hefte*, No. 5:25–28, **1951.** 3 figs., 5 refs. **MH-BH** In 1941 TAKATA described marked changes of "agglutination number" of blood serum in relation to sunspots. He also found a decrease at night or underground and when subject is negatively charged. Author failed to reproduce these results. *Subject Headings:* **1. Solar influences 2. Sunspots 3. Physiology 4. Takata reaction.**—*C.E.P.B.*

TEMPERATURE

(*See also items:* 3.6–59, 3.6–76, 3.6–83, 3.6–85, 3.6–167, 3.6–169)

3.6–104 551.524.1:551.584.3:551.588.2(52)

Daigo, Y. and Maruyama, E., **On the distribution of air temperature in the Oze-plain (1st report).** *Journal of Meteorological Research*, Tokyo, 3(3):99–105, Feb. **1951.** 4 figs., 2 tables, 3 refs., 4 equations. In Japanese, English summary p. (5). **DWB**—The vertical distribution of air temperature in the layer near the ground was investigated on a high moor and on a plain covered with tall, perennial vegetation. By day, air temperatures near the

ground were higher on the moor than on the plain, the diurnal range of air temperature on the moor diminished with height and air temperature was greatest at a height of 205 cm (the height of grass) on the plain and diminished above this elevation. The heat quantity transported upward was calculated and the results are given. *Subject Headings:* **1. Temperature distribution 2. Micrometeorology 3. Topographic effects 4. Oze-plain, Japan.**—*From author's abstract.*

3.6–105 551.524.31:551.584.4

Daigo, Y. and Maruyama, E., **Air temperature in observation field and in wheat field.** *Journal of Meteorological Research*, Tokyo, 3(3):106–108, Feb. **1951.** 2 figs., equations. In Japanese, English summary p. (6). **DWB**—Regression equations for air temperature at a weather station and in a wheat field are given. These equations are for minimum temperatures on clear and cloudy or rainy days, maximum temperature on clear and cloudy days, and diurnal range of temperature on clear and cloudy days. *Subject Headings:* **1. Air temperature variations 2. Temperature distribution 3. Microclimatology 4. Japan.**—*I.L.D.*

3.6–106 551.524.35:523.74

Tetrode, P., **Sunspots and the occurrence of unprecedented excesses of mean temperature over a wide area.** *Weather*, 7(1):14–15, Jan. **1952.** table, 8 refs. **DWB**—High mean temperatures for April 1947–March 1950 were about equal to 3 years 1778–1781 in Europe and probably the U. S. A. At beginning of each warm spell sunspot numbers reached record annual means (1778, 154; 1947, 151). *Subject Headings:* **1. Temperature variations 2. Sunspot effects.**—*C.E.P.B.*

3.6–107 551.524.37

Stirling, R. J., **Frosts in May.** *Weather*, 7(2):40, Feb. **1952.** fig. **DWB**—Detailed map of S.E. England for May 1950 showing areas with mean minimum air temperature below 32°F., 33–41° and above 41°. Discussed in relation to hills. *Subject Headings:* **1. Frost 2. Minimum temperatures 3. England.**—*C.E.P.B.*

3.6–108 551.524.7:551.587:551.585.7(437)

*Stružka, Vl., **Ubývaní teploty s nadmořskou ývškou u nas.** [Temperature lapse rate above sea level in our country.] *Meteorologické Zprávy*, 4(1–2):21–22, **1950.** fig., 5 tables, 5 refs. **MH-BH**—The temperature lapse rate is not constant. Seasonal changes and various changes in air conditions will influence it. It is also different near the ground as compared to free air. A table shows the monthly gradient for three different mountains. A second table of averages for the whole of Czechoslovakia is based on the years 1851–1900. The data for Bohemia and Moravia included in a third table are based on the normal period (1901–1930). *Subject Headings:* **1. Vertical temperature gradient 2. Mountain meteorology 3. Normal period (1901–1930) 4. Czechoslovakia.**—*G.T.*

SOIL TEMPERATURE

3.6–109 551.525.4/5:06

Aniol, Rudolf, **Der Bodenfrost-Meldedienst in the US-Zone.** [The soil freezing reporting service in the U. S. Zone of Germany.] *Umschau*, Frankfurt, a.M., 50(23):715–716, Dec. **1950.** 2 figs. **DLC**—Note on the soil freezing service established in the U. S. Zone in 1948 by Karl Knoch. Records are based on reports on frost penetration depth received from 60 stations with soil thermometers and about 700 towns where measurements are made in conjunction with grave digging. Depth of frost penetration during 1948/49 and 1950 are presented in charts and commented on. *Subject Headings:* **1. Frozen soil 2. Soil temperature networks 3. Germany.**—*G.T.*

3.6–110 551.525.4/5

Kreutz, Wilhelm, **Bodenfrost.** [Soil freezing.] *Umschau*, Frankfort a.M., 50(2):46–47, Jan. **1950.** 5 figs., 2 tables. **DLC**—Soil freezing data recorded at the Giessen (Germany)

Agrometeorological Research Station during the winters 1939/40, 1946/47, 1947/48 and 1948/49 are presented in tables and graphs in terms of depth of freezing, penetration speed and comparison between soil and air temperature. *Subject Headings:* **1. Soil freezing 2. Giessen, Germany.**—*G.T.*

3.6–111 551.525.5:551.579.5

*Bac, Stanisław, **Gleba zyje również w zimie.** [The soil is alive in winter.] *Gazeta Obserwatora PIHM*, Warsaw, 3(9):1–5, Sept. **1950.** 4 figs., table. **DLC**—The process of heaving and sinking of the soil in winter as a result of frost and freezing ground moisture and water is described and explained. Methods of measurement of the movement and results of such measurements obtained at two meteorological stations during the 1938–1939 winter are presented in tables and graphs. The influence of the phenomenon upon winter crops is discussed. *Subject Headings:* **1. Frost heaving 2. Soil freezing 3. Soil temperatures 4. Poland.**—*A.M.P.*

3.6–112 551.525.5

Hénin, Stéphane and Robichet, Olivier, **Mécanisme du soulevèment du sol sous l'influence du gel.** [Mechanism of soil heaving by frost.] *Académie des Sciences, Paris, Comptes Rendus*, 232(25):2358–2360, June 18, **1951. DWB**—Results of observations made at Versailles and elsewhere during 1946–1947 on the kind of ice crystals formed and the amount of frost heaving in different kinds of soil are briefly noted. It is concluded that the heaving cannot be due to the expansion of ice while freezing, but to vertical columns of ice forming and drawing water from below and around the frost boil. Manometer readings and dry areas around the ice columns support this conclusion. *Subject Headings:* **1. Frost heaving 2. Freezing of water 3. Frozen soil.**—*M.R.*

3.6–113 551.525.5:69

Nees, L. A., **Pile foundations for large towers on permafrost.** *American Society of Civil Engineers, New York, Proceedings*, 77, Separate No. 103, Nov. **1951.** 10 p. graphs, diagrs. **DWB**—Tests were made on adhesion of steel poles in permafrost in soils of various moisture content and temperatures. A safe value for most soils is 20 lb/sq in. A suitable design for foundations requires a minimum embedment of 20 ft and concrete pads against heat conduction. *Subject Headings:* **1. Building construction 2. Permafrost.** *C.E.P.B.*

3.6–114 551.525.5:69(02)551.524.37

Ruckli, Robert, **Der Frost im Baugrund.** [Frost in building foundations.] Vienna, Springer, **1950.** 274 p. 112 figs., tables, refs., equations. **DWB** A comprehensive monograph giving the results of field observations and of laboratory investigations on ground frost, the results of practical experience with various building methods in frozen ground and presenting a mathematical treatment of the ground frost problem. Pt. I, which is descriptive, covers the following topics: the effects of frost and frost damage in building foundations; types of soil ice, field investigation to explain the phenomenon of frost, frost damage and heaving systematic observations on the effect of frost on streets and roads; the design of field experiments; effect of pressure, physical chemical properties of soil, soil constituents, etc. upon the freezing of soil; criteria of frost. Pt. II treats the frost problem mathematically and includes the following subjects: climatic frost conditions, correlation between duration, intensity and frequency of cold periods; diffusion of heat in the soil, the theory of temperature relationships in the soil, practical measurements of soil temperature; penetration of frost into the soil; flow of water in the soil and calculation of frost heaving; the influence of surface properties of the soil upon penetration of frost, the application of the principles of analogy to frost experiments; the cold storage problem. Pt. 3 deals with various measures for preventing frost damage and with techniques for analyzing the effects of frost. *Subject Headings:* **1. Frozen soil 2. Frost damage 3. Frost heaving 4. Frost penetration 5. Building construction 6. Industrial meteorology.**—*I.L.D.*

ATMOSPHERIC PRESSURE AND WIND

PRESSURE

(*See also item:* 3.6–77)

3.6–115 551.543.6

§Shellard, H. C. and Douglas, C. K. M., **Low pressure recorded on February 4, 1951.** *Meteorological Magazine*, London, 80(954):362–364, Dec. **1951.** fig. **MH-BH** –Depression centered over Ireland gave a M.S.L. pressure 942.3 mb at Midleton, County Cork. Lowest Feb. pressure on record in British Isles. *Subject Headings:* **1. Pressure variations 2. Eire.** –*C.E.P.B.*

3.6–116 551.547

Garriock, A., **Changes in thickness between isobaric surfaces due to advection as shown by pilot balloon observations.** *Weather Development and Research Bulletin*, Melbourne, No. 17:33–35, Aug. **1951.** fig., equations. **DWB** -Brief article giving a graphical and mathematical method of determining the vertical thickness of an isobaric interval (between two constant pressure surfaces) from pilot balloon data alone. The formula is: $\frac{\delta(\Delta z)}{\delta t}=0.28 Va\ Vb \sin\theta \sin\varphi$. Va and Vb are measured winds at base and top of layer, respectively, and θ is the angle between the winds. *Subject Headings:* **1. Isobaric analysis 2. Kinematic analysis 3. Pilot balloon data.**—*M.R.*

3.6–117 551.547.1:551.571.7

Buchanan, R. A., **Humidity corrections in the evaluation of heights from a tephigram.** *Meteorological Magazine*, London, 81(955):11–14, Jan. **1952.** fig., table, equations. **DWB**—To aid computation of virtual temperature, a table is given of correction to dry bulb for various mixing ratios and a short method of computing height of pressure levels is described with example. *Subject Headings:* **1. Height computation 2. Virtual temperature.**—*C.E.P.B.*

WIND

(*See also items:* 3.6–9, 3.6–50, 3.6–72, 3.6–75, 3.6–80, 3.6–83, 3.6–86)

3.6–118 551.551(54)

*Agarwala, K. S., **On the gustiness of wind and occurrence of gusts of Vishkhapatnam.** *Indian Journal of Meteorology and Geophysics*, 2(4):277–283, Oct. **1951.** 5 tables, 2 refs. **MH-BH** Description of the results of a 3-year record of the Dines tube anemograph. Diurnal and annual variation and influence of the wind direction are discussed. *Subject Headings:* **1. Wind data 2. Gustiness 3. Wind variations 4. Wind effects 5 .Vishkhapatnam, India.**—*A.A.*

3.6–119 551.551:551.593.12

Boutet, R., **Sondage optique de l'atmosphère par mesure de la scintillation.** [Optical sounding of the atmosphere by measurement of scintillation.] *Annales de Géophysique*, 6(4):322–330, Oct.–Dec. **1950.** 7 figs., table, 4 refs., equations. French and English summaries p. 322. **DBS**—The type of refracting telescope and procedure for making systematic atmospheric soundings by measuring diffracted stellar images are described. The measurements of turbulence fell into three types: turbulence in proportion to the thickness of the layer of air traversed, microturbulence (condition preceding storm) and atmospheric Helmholtz waves, which are schematized by means of a sinusoidal dioptric surface. The equations of the wave surface are developed. *Subject Headings:* **1. Turbulence spectrum 2. Scintillation 3. Helmholtz waves.**—*I.L.D.*

3.6–120 551.551:551.508.53/4

Frenkiel, F. N., **Introduction to some topics on turbulence.** *Maryland. University, Institute for Fluid Dynamics and Applied Mathematics, Lecture Ser.*, No. 3, **1950.** 103 p. numerous figs., refs., equations. Mimeographed. **DWB**—Several lectures by the author,

given at the University of Maryland as an introduction to a course in statistical theory of turbulence. The theory of turbulent diffusion according to the statistical concept, which began in 1920 with G. I. TAYLOR's classic paper and was followed in 1935 by TAYLOR's second paper, is covered in lecture I. In subsequent lectures the experimental measurements, the statistical kinematics of turbulence, the Karman-Howarth equation, hot wire anemometry, one-dimensional spectrum of turbulence, probability distribution, isotropic, and locally isotropic turbulence are treated theoretically and references listed for each lecture. *Subject Headings:* **1. Statistical theory of turbulence 2. Hot wire anemometers. I. Pai, S. I.** (*ed.*) **II. Maryland. University. Institute for Fluid Dynamics and Applied Mathematics.**—*M.R.*

3.6–121 551.552(261/4)

Gordon, A. H., **Vorticity of mean vector surface winds over the Atlantic Ocean.** *Royal Meteorological Society, Quarterly Journal*, 78(335):85–88, Jan. **1952.** 2 figs., table, 5 equations. Appendix by N. Carruthers. **DWB**—Mean vector surface winds for 5° squares over Atlantic were used to compute vorticity. Isolines by latitude and month are shown. Monthly values 10–20°N have a high association with frequency of hurricanes. Appendix discusses variance of vorticity. *Subject Headings:* **1. Vorticity 2. Atlantic Ocean. I. Carruthers, Nellie.**—*C.E.P.B.*

3.6–122 551.553.12

Gleeson, Thomas A., **On the theory of cross-valley winds arising from differential heating of the slopes.** *Journal of Meteorology*, 8(6):398–405, Dec. **1951.** 4 figs., table, 11 refs., 24 equations. **MH-BH**—A mathematical study of the relation between the diurnal variation of the cross-valley wind and different values of friction, latitude, orientation and slopes of the valley, and solar altitude. The results are compared with pilot balloon observations at 2-hour intervals in summer in Columbia River valley, directed N–S, with good qualitative results. *Subject Headings:* **1. Cross-valley winds 2. Columbia River valley.**—*C.E.P.B.*

3.6–123 551.556:551.465

Carruthers, J. N., Lawford, A. L. and Veley, V. F. C., **Studies of water movements and winds at various lightvessels. II. At the Seven Stones lightvessel near the Scilly Isles.** *Marine Biological Association of U.K., Journal*, 29(3):587–608, **1951.** 9 figs., 4 plates, 3 tables, 8 refs., 5 equations. **DWB** Wind and current observations in 50°3′N, 6°5′W July 1939–May 1941 (14 mi W. of Land's End) are summarized and relations between residual wind and residual water movement shown graphically for each month, and for different wind speeds and directions. These are compared with theoretical relations. *Subject Headings:* **1. Wind driven currents 2. Great Britain.**—*C.E.P.B.*

3.6–124 551.556:551.465

Hansen, Walter, **Beobachtungen des Windstaus und Triftstroms im Modellkanal.** [Observations of wind thrust and drift current in a model canal.] *Deutsche Hydrographische Zeitschrift*, 4(3):81–91, **1951.** 8 figs., 6 tables, 5 refs. German, English and French summaries p. 81. **DWB**—The shape of the water surface and the vertical distribution of velocities in relation to the wind were investigated in a small right-angled canal in Hanover, and compared with values calculated by various equations derived from observations at sea. Numerical values of virtual viscosity are derived. *Subject Heading:* **1. Wind driven currents.**—*C.E.P.B.*

3.6–125 551.557

Sarasola, Simón, **Investigaciones sobre las corrientes superiores en Colombia.** [Investigations on upper air currents in Colombia.] *Revista Meteorológica*, Montevideo, 10(36/37):13–15, Jan.–April **1951.** **MH-BH**—Reviews attempts to prove that the prevailing winds in Colombia are the antitrades. Observations of clouds made in 1933 and published in *Observatorio Nacional de S. Bartolomé, Anales* show that there are no strong arguments in favor of the theory that the antitrades are the prevailing winds because the upper air current is not stable. Similar article, *ibid.*, 1(1):31–34, Jan. 1942. *Subject Headings:* **1. Upper air winds 2. Colombia.**—*M.L.R.*

3.6–126 551.557.35

Gabriel, Jack E. and Bellucci, Raymond, **Time variation of winds aloft.** *Journal of Meteorology*, 8(6):422–423, Dec. 1951. fig., 2 tables, 4 refs. **MH-BH**—From 94 pairs of pilot balloon flights, vector velocity changes in intervals of 50 min. to 2 hours are tabulated and analyzed. After correction for tracking errors, changes averaged about 4 m.p.h. at all heights. *Subject Heading:* **1. Upper air wind measurements.**—*C.E.P.B.*

3.6–127 551.558.21:797.5

Kessel, Emil, **Soaring waves at Warm Springs Airport.** *Soaring*, 15(4):10, July/Aug. 1951. graph. **DLC**—A schematic diagram shows relation of wave to topography from San Francisco Bay to altitude of 6000 ft to the lee of a 1500 ft ridge. At times the wave extends to 7200 ft and has been known to give lift to a glider to 12,500 ft. Area of greatest turbulence is shown to be along inversion surface between NW (cold maritime) and NE (warm continental) air. *Subject Headings:* **1. Atmospheric turbulence 2. Standing waves 3. Gliding 4. San Francisco Bay, California.**—*M.R.*

3.6–128 551.558.29

Phillips, P. E., **Clear air turbulence.** *Meteorological Magazine*, London, 80(954):361–362, Dec. 1951. fig. **MH-BH**—Violent turbulence reported (plane fell from 4800 to 3000 ft in 5 sec) in light winds over flat ground near Singapore April 17, 1951. As this would mean acceleration of 9 g, estimates are probably erroneous because crew did not black out. Explanation obscure. *Subject Heading:* **1. Atmospheric turbulence.**—*C.E.P.B.*

AQUEOUS VAPOR AND HYDROMETEORS

WATER VAPOR AND CLOUDS

(*See also items:* 3.6–24, 3.6–48, 3.6–63, 3.6–64, 3.6–138, 3.6–139, 3.6–117, 3.6–172)

3.6–129 551.571.4

Johnson, N. K., **Vertical distribution of atmospheric humidity near the ground.** *Nature*, London, 167(4238):109, Jan. 20, 1951. 2 figs. **DLC**—Summarizes results from autographic records of temperature and humidity at various heights at Rye, Sussex, 1945–1948. The figures show diurnal variation of absolute humidity and humidity gradient in August. *Subject Headings:* **1. Humidity distribution 2. Rye, England.**—*C.E.P.B.*

3.6–130 551.573

†Budyko, M. I., **O vliianii meliorativnykh meropriiatiĭ na ispariaemost'.** [On the influence of amelioration measures upon evaporation.] *Akademiia Nauk, SSSR, Izvestiia, Ser. Geogr.*, No. 1:16–35, **1951.** 8 figs., 28 refs., 7 equations. **DWB**—The author presents a critical analysis of existing methods of determining and utilizing values of evaporation from land and water surfaces for physico-geographic calculations. He recommends the application of improved methods of calculating potential evaporation and its probable change under the effect of forest shelter belts. Numerous curves are presented to show the relationship between radiative heat transfer, mean temperature, turbulence, latitude, etc. and evaporation or potential evaporation. *Subject Headings:* **1. Evaporation 2. Potential evapotranspiration 3. Shelter belts.**—*A.M.P.*

3.6–131 551.574.1

Ohta, S., **Vapour pressure of a small solution particle. (Studies on condensation nuclei, V.)** *Journal of Meteorological Research*, Tokyo, 3(2):45–50, Jan. **1951.** fig., table, 5 refs., equations. In Japanese, English summary p. (2). **DWB**—Equations for the vapor pressure of a small solution particle are derived from the differential equations of thermal equilibrium and also from the virtual change of free energy. The relation between the radius of the particle and the relative humidity at the critical conditions was calculated numerically for nuclei consisting of H_2SO_4 and NaCl. *Subject Headings:* **1. Vapor pressure over drop 2. Condensation nuclei.**—*From author's abstract.*

3.6–132 551.575:536.632

Robitzsch, Max. **Die Eigentemperatur von Nebeltröpfchen.** [The temperature of fog droplets.] *Zeitschrift für Meteorologie*, 4:12 :353–356. Dec. 1950. 2 tables, equations. MH-BH—Gives expression for vapor over a droplet in saturated air, its temperature and equivalent temperature. From these, tables are calculated of vapor pressure over droplets 0.01 to 0.0001 cm radius, temperature −50 to +0°C, and temperature deficiency of droplets in saturated air at various pressures. For droplets containing salt, a "virtual radius" can be calculated. *Subject Headings:* 1. Fog 2. Saturation over drops.—*C.E.P.S.*

3.6–133 551.575.5:

Roy, A. K. **On the incidence of fog during winter in Calcutta and neighborhood.** *Indian Journal of Meteorology and Geophysics*, 2 :4 :305–306. Oct. 1951. MH-BH—Examination of the meteorological conditions which lead to the development of fog in the winter particularly over the Ganges Valley in which the airport of Calcutta and other international airports are situated. On the basis of 3 months' observations, it is concluded that in Calcutta fog is usually associated with a rising trend of the minimum temperature. *Subject Headings:* 1. Winter fog 2. Airports 3. Ganges Valley, India 4. Calcutta, India.—*A.J.*

3.6–134 551.575.1:[29.13

Gray, George J., Jr. **Ice fog and aircraft operations.** *Weatherwise*, 4:6 :128–130. Dec. 1951. 2 figs. DWB—While pure ice fog does not usually form above the temperature range of −40° to −60°F, in the presence of smoke in the air during a strong temperature inversion and light winds ice fog may form at temperatures −40° to 20°F. The physical conditions underlying the formation of ice fog, the characteristics of ice fog and its effect upon visibility, the effect of topography upon ice fog formation and specific conditions leading to its formation in Alaska and Greenland are discussed. *Subject Headings:* 1. Ice fog 2. Aeronautical meteorology 3. Topographic effects 4. Alaska 5. Greenland. *I.L.D.*

3.6–135 551.575.1

Kuroiwa, Daisuke. **Electron-microscope study of fog nuclei.** *Journal of Meteorology*, 8:3:157–160. June 1951. 12 figs., 5 refs. DWB—The application of electron microscopy to the study of fog nuclei is described. Micrographs of fog nuclei are presented. It is concluded that sea fog nuclei contain both hygroscopic and anti-hygroscopic nuclei. *Subject Headings:* 1. Fog formation 2. Condensation nuclei.—*I.L.D.*

3.6–136 551.575.36:551.589.1

Kobayashi, S. **The fog in Seto Inland Sea.** *Journal of Meteorological Research, Tokyo*, 5:(6):176–178. March 1951. 8 figs., 2 tables. [In Japanese; English summary p. 178.] DWB—A study of the relation between the frequency of sea fog in the Seto Inland Sea and synoptic conditions in May and June. Examples of sea fog and radiation fog are given. *Subject Headings:* 1. Radiation fog 2. Sea fog frequency 3. Synoptic climatology 4. Inland Sea (Seto), Japan.—*I.L.D.*

CLOUD PHYSICS

(See also items: 3.6–24, 3.6–33, 3.6–145)

3.6–137 551.576.1

Garrigue, Hubert. **Prospection aérologique et observations sur la pluie.** [Aerological sampling and observations on rain.] *Annales des Sciences Forestières, Champion, Nancy*, 8:2:193–207. July 16, 1951. DWB—A brief note summarizing the main findings at the Puy-de-Dôme station and by airplanes flying through clouds of various types in the Clermont-Ferrand, Puy-de-Dôme and Vichy-Sancy regions. Higher temperature about base, degree of supersaturation and nature of cloud particles were reported. It is concluded that clouds with temperatures above 0°C produce rain, either normally or artificially, and clouds with a temperature about −10° produce ice particles. *Subject Headings:* 1. Cloud physics 2. Rain formation 3. France.—*M.R.*

3.6–138 551.576.1:551.574.72:536.42

Kachurin, L. G., **Zamerzanie monodispersnykh vodnykh aerozoleĭ.** [Freezing of monodisperse aqueous aerosols.] *Akademiia Nauk, SSSR, Izvestiia, Ser. Geofiz.*, No. 2:43–49, 1951. 4 figs., 7 refs., 15 equations. **DLC** A method is presented for calculating the freezing of supercooled aqueous aerosols in the case of processes that are not too rapid in comparison to the time of freezing of individual droplets after stable ice nuclei have formed within them. The experimental determination of the energy at the boundary between ice and supercooled water is discussed and an example of the calculation of the complete freezing of supercooled monodisperse aqueous aerosols with a droplet diameter of 10^{-1} to 10^{-6} cm at temperatures of $-100°$ to 0°C is presented. *Subject Headings:* **1. Freezing of cloud droplets 2. Ice nuclei 3. Supercooled clouds 4. Aerosols.**—*I.L.D.*

3.6–139 551.576.1:551.574.72:536.42

Kachurin, L. G., **Zamerzanie polidispersnykh vodnykh aerozoleĭ.** [Freezing of polydisperse aqueous aerosols.] *Akademiia Nauk, SSSR, Izvestiia, Ser. Geofiz.*, No. 2:50–55, 1951. 3 figs., 9 refs., 18 equations. **DLC** Equations for calculating the freezing of polydisperse aqueous aerosols having a Smoluchowski-Schumann distribution are developed. It is shown by calculations of the freezing of aqueous aerosols with the above distribution for varying radii and rates of cooling that the maximum frequency of the formation of ice particles in the atmosphere at temperature $-10°$ to $-15°$C is determined by the maximum rate of freezing of natural clouds and fogs at these temperatures. *Subject Headings:* **1. Freezing of cloud droplets 2. Ice nuclei 3. Supercooled clouds 4. Aerosols.**—*I.L.D.*

3.6–140 551.576.11

Austin, A. R. L., **Wave clouds over southern England.** *Weather*, 7(2):50–53, Feb. 1952. 2 figs., table. **DWB** Large lenticular fibrous clouds at 8000–32000 ft, above Cu, seen from the air over Farnborough, Hampshire, Sept. 24, 1951, showed ruffled surfaces. The clouds are attributed to standing waves. Upper air data given. Notes by R. S. Scorer and F. H. Ludlam. *Subject Headings:* **1. Cloud structure. I. Scorer, R. S. II. Ludlam, F. H.**—*C.E.P.B.*

PRECIPITATION

(*See also items:* 3.6–16, 3.6–87, 3.6–149, 3.6–152, 3.6–161, 3.6–176)

3.6–141 551.577:63(94)

Gentilli, J., **Bioclimatic changes in Western Australia.** *Western Australian Naturalist*, Perth, 2(8):175–184, April 30, 1951. 6 diagrs., 14 refs.—Author gives for W. Australia maps of additional rainfall needed to support vegetation of average transpiration in Jan., April, July, Oct. and year and effect of changes of rainfall on desert margin. Increase by 20 inches would carry "hygrostatic balance" less than 100 miles further into interior. *Subject Headings:* **1. Rainfall 2. Bioclimatology 3. Western Australia.**—*C.E.P.B.*

3.6–142 551.577.37:902

Hawke, E. L., **Rainfall in a 'cloudburst.'** *Nature*, London, 169 (4292):204, Feb. 2, 1951. **DLC** From statements in a pamphlet: "Strange relation of the sudden and violent tempest which happened at Oxford, May 31 anno domini 1682," Oxford (Sherlock) 1682, rate of rainfall is calculated as about 3 inches per minute for 7 minutes. *Subject Headings:* **1. Cloudbursts 2. Historic weather records.**—*C.E.P.B.*

3.6–143 551.577.52(47)

Kalinin, G. P., **Rol' lesa v raspredelenii osadkov.** [The role of forests in the distribution of precipitation.] *Meteorologiia i Gidrologiia*, No. 1:14–20, Sept. 1950. 3 figs. **DLC**—For this study, long period observations at 100 meteorological stations in the Moscow region were used. In some forest regions the excess of annual precipitation is 15%, the excess during the warm season about 20%, and during the cold period about 8–10%. The average for the Moscow area in the forest regions is an excess of about 10%, depending on the area of the forest with the large areas showing greater excess in the amount of precipitation. Relationships are

shown by scatter diagrams which reveal the variations in seasonal precipitation in forested and unforested areas with size of area, etc. *Subject Headings:* **1. Precipitation distribution 2. Forest influences 3. Moscow Region, U.S.S.R.**—*N.T.Z.*

3.6–144 551.577.52

Takeda, K., **Rainfall in forest.** *Meteorological Society of Japan, Journal, 2nd Ser.*, 29(6): 199–212, June **1951.** 15 figs., 7 refs., numerous equations. In Japanese, English summary p. 209–212. **MH-BH**—Author develops a formal equation for precipitation in a forest reaching ground directly or by dripping, that caught by crowns and that flowing down stem. Numerical results are calculated for various intensities of rainfall and are illustrated for spruce and beech. *Subject Headings:* **1. Precipitation effectiveness 2. Forest influences.**—*C.E.P.B.*

3.6–145 551.578.11:551.576.11

Shvets, M. E., **K voprosu ob izuchenii oblachnykh kapel' na tverdykh telakh.** [The falling of cloud droplets on solids.] *Leningrad, Glavnaia Geofizicheskaia Observatoriia, Trudy*, No. 24(86):80–82, **1951.** 7 equations. **DLC**—In order to study the trajectories of large drops experimentally, the author develops models for the movement of drops which satisfy the criteria of similarity of relative motion of the drop and that of fluid currents. *Subject Headings:* **1. Raindrop velocity 2. Cloud physics 3. Drop formation.**—*I.L.D.*

3.6–146 551.578.11

Ward, R., **Rain from non-freezing cloud.** *Meteorological Magazine*, London, 81(956):56–57, Feb. **1952.** fig., 2 photos. **DWB**—Describes case of May 22, 1945, in 43.1°N, 14.3°W, with tephigram. Photos show 10/10ths Nb St, 940–760 mb, freezing level 740 mb. *Subject Heading:* **1. Rain from nonfreezing clouds.**—*C.E.P.B.*

3.6–147 551.578.41

Blanchard, Duncan C., **A verification of the Bally-Dorsey theory of spicule formation of sleet pellets.** *Journal of Meteorology*, 8(4):268–269, Aug. **1951.** 2 figs., 7 refs., 4 equations. **MH-BH**—It is calculated that a falling drop of freezing rain would take 200 sec to collect enough water to form a spicule (such as is illustrated) by vapor condensation, as was formerly thought to be the cause. The shorter, actual observed time of 6 sec would demand another explanation such as that pressure on the unfrozen water in the interior of the drop forces water out through a weak spot in the freezing shell, and later through a freezing tube which grows rapidly. The latter theory suggested by N. E. Dorsey (1938) and Bally (1935) seems to be verified by laboratory experiments measuring temperature, volume and rate of growth. *Subject Headings:* **1. Sleet pellets 2. Spicule formation 3. Freezing of water. I. Bally, O. II. Dorsey, N. E.**—*M.R.*

3.6–148 551.578.41

Mason, B. J., **Snow crystals, natural and artificial.** *Endeavour*, London, 10(40):205–212, Oct. **1951.** photo., table, diagr., refs. **DLC**—The formation of snow crystals in the atmosphere is discussed and a theory of their growth developed in terms of their molecular and surface structures, their fall-motion and the meteorological conditions in the parent cloud. A simple apparatus for the production of ice crystals in a laboratory is suggested and a technique for preparing plastic replicas of crystals as devised by V. J. Schaefer is described. Photomicrographs of snow and ice crystals and plastic replicas are reproduced. A table containing a classification of ice crystals based on H. Weickmann's observations according to cloud type, temperature, humidity and vapor pressure range is added. *Subject Headings:* **1. Snow crystal formation 2. Cloud physics 3. Snowflake growth. I. Weickmann, Helmut II. Schaefer, Vincent J.**—*G.T.*

3.6–149 551.578.45:551.577.51:551.585.7(47)

Brudin, I. D., **Snezhnye buri v otrogakh iuzhnogo Predural'ia.** [Snowstorms in the spurs of the Southern Urals.] *Vsesoiuznoe Geograficheskoe Obshchestvo, Izvestiia*, 83(2):205–206, March–April **1951.** **DLC**—The author describes the topography in the Chkalov Region and several instances of heavy snowfall during 1948 and 1949. The highest elevations of the

Southern Urals were found to be the coldest and had the highest snowfall and longest duration of snow cover. *Subject Headings:* 1. **Snowstorms** 2. **Orographic effects** 3. **Mountain observations** 4. **Southern Urals, U.S.S.R.**—*I.L.D.*

3.6–150 551.578.45

McQuarrie, A. F. and Pickering, C., **A record June snowstorm at Calgary, Alberta.** *Weatherwise*, 4(4):91–92, Aug. 1951. **MH-BH**—The snowstorm occurred on June 5–6, 1951. A total of 16 inches of snow fell in 36 hours; the greatest amount measured on the ground at any time was six inches. The synoptic conditions which brought about the snow are described. *Subject Headings:* 1. **Snowstorms in summer** 2. **Calgary, Alberta.**—*I.L.D.*

HYDROMETEOROLOGY

(*See also items:* 3.6–51, 3.6–111)

3.6–151 551.579.4(47)

Ivanov, I. V., **K voprosu o vliianii zalesennosti basseĭna reki na vysotu vesennego polovod'ia.** [On the influence of forested river basins on the height of the spring flood.] *Meteorologiia i Gidrologiia*, No. 1:41–47, Sept. 1950. 2 figs., table, 3 refs. **DLC**—A brief review of works by Voeĭkov, Kochergin, Ogievskiĭ and others on the relation between forests and spring floods of rivers and a summary of investigations which were made by the author for 123 rivers in European Russia. The author concludes from statistical tests that in completely forested areas the spring flood of rivers is higher than in regions where forests cover about ½ of the whole area. All empirical formulas presented heretofore should be re-examined. *Subject Headings:* 1. **Spring floods** 2. **Forest influences** 3. **U.S.S.R.**—*N.T.Z.*

3.6–152 551.579.4:551.577.3

Iwai, Shigebisa, **A hydrostatistical study on duration curves.** *Japan Science Review, Series I, Engineering Sciences*, 1(1):3–8, March 1949. In English. 2 diagrs., 11 refs., equations. **DWB**—A theoretical, statistical study on the duration curves of hydrologic data such as rainfall and river discharges. Slade's Type Distribution was adopted as the statistical asymmetric distribution of these data. The distribution was divided into two types: one with a limiting value on one side only and the other with limiting values on both sides. A mathematical analysis of frequency and duration curves of each type is presented. It is concluded that Slade's Type Distribution is the most suitable method for estimating duration curves. *Subject Headings:* 1. **Hydrology** 2. **Rainfall influences** 3. **River discharges** 4. **Slade's Type Distribution.**—*I.L.D.*

3.6–153 551.579.4

Reichel, Eberhard, **Hochwasser in Oberitalien.** [Flood in upper Italy.] *Umschau*, Frankfurt a.M., 51(24):746–747, Dec. 1951. 2 figs. **DLC**—Case history of unusually destructive floods in upper Italy in November 1951. Meteorological characteristics of the region are discussed and comparative mean precipitation data given. Development of the synoptic situation connected with the flood is analyzed and a typical daily synoptic chart is presented. Author concludes that the floods were caused by simultaneous occurrence of several factors, not one of which by itself was unusual. Speculations as to the possible effect of atomic explosions are dismissed. *Subject Headings:* 1. **Floods** 2. **Italy.**—*G.T.*

CLIMATOLOGY AND BIOCLIMATOLOGY

CLIMATOLOGY

3.6–154 551.58

Samoĭlenko, V. S., **A. A. Borisov. Klimatologiia.** [Review: Climatology by A. A. Borisov.] *Meteorologiia i Gidrologiia*, No. 1:79–80, Sept. 1950. **DLC**—A severe criticism of the manual. After having announced that the book does not contain any original idea on the subject, that it is nothing more than a disorderly mixture of extracts from other works on climatology and that it is difficult to find in some chapters a page without crude errors, dis-

crepancies or a collection of obscure and empty phrases—the reviewer proceeds to give examples as proof. The questions of climate, climatology and climatic analysis of meteorological observations and data of cloudiness, humidity, temperature and wind variations are specially criticized and errors pointed out. Descriptions of climate of individual zones and regions when described only but not commented on by the author are the only correct parts of the book. In conclusion, the reviewer expresses his bewilderment that this sort of "scientific work" could have been adopted by order of the Council of Ministers of the U.S.S.R. as a manual for schools which train specialists for the State Hydrometeorological Service. *Subject Headings:* **1. Climatology 2. Critical reviews. I. Borisov, A. A.**—*A.M.P.*

CLIMATOLOGY OF PARTICULAR PLACES

(*See also items:* 3.6–172, 3.6–173)

3.6–155 551.582:016(931)

*†Garnier, Benjamin John (*ed.*), **New Zealand weather and climate.** Christchurch, New Zealand, Whitcomb and Tombs, **1950.** 154 p. tables, graphs, diagrs., charts, biblio. p. 141–147. **DLC**—The first of a series of publications which the New Zealand Geographical Society inaugurated in order to collect many scattered articles on the climate and geography of New Zealand. Included are articles by N. G. Robertson, "Organization and development of weather observations in New Zealand"; E. M. Watts, "Forecasting New Zealand weather"; Edward Kitson, "The elements of New Zealand's climate"; Benjamin John Garnier, "Climates of New Zealand according to Thornthwaite's classification" and "The seasonal climates of New Zealand." In addition, a list of 142 publications on New Zealand climate, classified according to source, and basic climatic data for 40 stations in New Zealand (monthly and annual temperature, precipitation, P-E and T-E) are included. Articles will be abstracted separately. *Subject Headings:* **1. Climatology 2. Climatic data 3. Bibliographies 4. Climate of New Zealand 5. New Zealand. I. New Zealand Geographical Society. Miscellaneous Series, No. 1 II. New Zealand Geographical Society. Special Publication.** —*M.R.*

3.6–156 551.582(267) 551.587(267)

Great Britain. Meteorological Office, **Weather in the Indian Ocean to latitude 30°S and longitude 95°E, including the Red Sea and Persian Gulf. Volume II. Local information. Part I. Red Sea.** 109 p. **1951.** 22 figs., tables, 42 refs. M.O. 451b(I).—The text summarizes physical features and typical weather and the usual climatological elements, also fronts and depressions, upper air winds, upper air temperatures and humidities, and icing. The information is shown graphically in numerous charts and diagrams, including daily weather at Ismailia and Perim, intertropical convergence zone, sea temperature, etc. Full climatic tables are given for 14 stations, with details of winds, visibility and ceiling. *Subject Headings:* **1. Aeronautical climatology 2. Climatic surveys 3. Red Sea.**—*C.E.P.B.*

3.6–157 551.582(931)

*Kidson, Edward, **The elements of New Zealand's climate.** (In: Garnier, B. J. (*ed.*), **New Zealand weather and climate.** Christchurch, New Zealand, Whitcomb and Tombs, **1950.** p. 45–83. tables, charts, diagrs.) Reprint of Chap. 7 of: **Agricultural Organization in New Zealand.** H. Poelshaw (*ed.*). **1936. DLC**—A concise but complete coverage of the main elements in the climate of New Zealand, amply supported by data and charts or graphs of various types. Chapters include those on weather regimes; prevailing winds and frequencies; effect of wind on flora and fauna; precipitation, including variability in time and space, and its influence on plants and animals; same for temperature, snowfall, frost, hail, thunderstorms and fog. *Subject Headings:* **1. Climate of New Zealand 2. Climatic data 3. New Zealand.** —*M.R.*

3.6–158 551.582.1(76):551.586:612

Carson, Robe Barrett, **The Florida tropics.** *Economic Geography*, 27(4):321–339, Oct. **1951.** diagrs., graphs, refs. **DWB**—An examination of the climatic characteristics of Florida which influence its economic development, in particular that of SE Florida. The climatic contrasts within Florida are discussed in reference to its position within the trade winds and

ddle latitude westerlies, to differences in cooling power as measured by the katathermometer, the stalled cold fronts and to precipitation. The physiological effects of the climate upon n are also considered. *Subject Headings:* 1. Tropical climatology 2. Physiological climatology 3. Applied climatology 4. Florida.—*I.L.D.*

3.6–159 551.582.2(931)

*Climatic data for forty stations in New Zealand. In: Garnier, B. J. (*ed.*), New Zealand weather and climate. Christchurch, New Zealand, Whitcomb and Tombs, 1950. p. 149–152. bles. DLC—Includes mean monthly and annual temperature, precipitation, P-E and T-E 40 stations, with their coordinates and length of record. *Subject Headings:* 1. Climatic ta 2. New Zealand I. Garnier, B. J. (*ed.*).—*M.R.*

3.6–160 551.582.2:551.506.5(99)

Schwerdtfeger, Werner, Meteorología antárctica. [Antarctic meteorology.] *Meteoros*, enos Aires, 1(2–3):221–223, June 1951. 3 tables. DWB—A long review summarizing d analyzing the aerological data published in *Monthly Weather Review, Supplement* No. 48, epared by Arnold Court (*see item* No. 2–160 in Feb. 1950 *Meteorological Abstracts*). Pressure, temperature and wind data are presented for each standard level for summer (36 radiosonde d 319 pilot balloon observations) and for winter (70 radiosonde and 263 wind aloft observations) for Little America for 1940–1941 and for 1929, 1934 and 1940, respectively. *Subject Headings:* 1. Climatic data 2. Antarctic meteorology 3. Radiosonde data 4. Reviews Little America 6. Antarctica. I. Court, Arnold.—*M.R.*

3.6–161 551.577.3(931):551.582.3

Seelye, C. J., Maps of extreme monthly rainfall in New Zealand. Wellington, New aland, Meteorological Office, May 1946. [18 p.] all charts. DWB—Detailed zipatone arts of New Zealand show frequency of monthly total rainfall below 1 in. or above 6 in. each of four seasons, and actual maximum and minimum monthly rainfall for each of these asons for the period 1911–1940. Isopleths were drawn on the basis of records of 134 stations 30 years, and of 192 stations with shorter periods or with a different period of record. *bject Headings:* 1. Rainfall charts 2. Rainfall extremes 3. New Zealand. I. New Zealand eteorological Service.—*M.R.*

CLIMATIC CHANGES

(*See also item:* 3.6–100)

3.6–162 551.583.14:634.94

Regel, C., Zur Klimaänderung der Gegenwart. [On the present climatic change.] *perientia*, Basel, 8(1):34–35, Jan. 1952. 5 refs. French summary p. 35. DLC—In rthern Sweden the pine, which formerly rarely seeded, has done so abundantly in the last decades and there are numerous young trees and the forest is invading the tundra. This is e to the warmer, drier climate. It does not apply to the spruce. *Subject Headings:* 1. matic changes 2. Forest limits 3. Warming of Arctic.—*C.E.P.B.*

3.6–163 551.583.2:551.586:634.9

Chelchowski, Włodzimierz, Słoeje drzewne a klimatologia. [Tree rings and climatology.] *zeta Obserwatora PIHM*, Warsaw, 3(12):5–6, Dec. 1950. DLC—The relationship between width of tree rings and changes of climatic conditions is discussed and the work of Douglass others reviewed. *Subject Headings:* 1. Historical climates 2. Dendrochronology.—*M.P.*

3.6–164 551.583.3/7:551.77(73)

Antevs, Ernst, Cenozoic climates of the Great Basin. *Geologische Rundschau*, 40(1):94–3, 1952. 52 refs. DLC—During the Tertiary the Great Basin of the western United ites grew cooler and, as a result of the rise of the Sierra Nevada and Cascades, progressively er. The fluctuating climatic conditions during the glaciofluvials of the Ice Age and the post-

glacial succession since 7000 B.C.—Anathermal (humid cool), Altithermal (arid, warm) a Medithermal—are described in detail. *Subject Headings:* **1. Paleoclimatology 2. Pluv periods 3. Great Basin, United States.**—*C.E.P.B.*

3.6–165 551.583

Bilancini, Raoul, **L'aumento della temperatura della terra.** [The increase of the te perature of the earth.] *Rivista di Meteorologia Aeronautica*, 10(4):3–16, Oct.–Dec. 195 2 figs., 2 tables, 25 refs. Italian, French, English and German summaries. **MH-BH**— analysis of actual or assumed changes in temperature in various epochs of the post-glaci and periods of historic time down to the latest period of warming (1891–1950) and the caus of these changes according to current theories. Works of C. E. P. BROOKS and GROISSMAYR a cited as to evidence, and of PETTERSSEN as to mechanics (effect on general circulation), well as of many other writers. *Subject Headings:* **1. Climatic changes 2. Warming of Arct 3. Historical climates.**—*M.R.*

MICROCLIMATOLOGY

(*See also items:* 3.6–32, 3.6–104, 3.6–105)

3.6–166 551.584:551.553

Berliand, M. E., **K teorii izmeneniia vetra v prizemnom sloe atmosfery.** [The theory wind variation in the atmospheric layer near the ground.] *Leningrad, Glavnaia Geofizicheska Observatoriia, Trudy*, No. 23(85):66–75, **1951.** 2 figs., 5 refs., 29 equations. **DLC**—This a theoretical analysis of: 1) the daily march of the wind and 2) the determination of the vari tion of wind velocity with time if the initial height distribution of the wind and the variatio of the gradient wind are known. General equations for determining these phenomena a derived. *Subject Headings:* **1. Micrometeorology 2. Diurnal wind variations 3. Wi velocity.**—*I.L.D.*

3.6–167 551.584:551.524

Berliand, M. E., **K teorii teplovogo rezhima prizemnogo sloia vozdukha.** [The theory the heat regime of the atmospheric layer near the ground.] *Leningrad, Glavnaia Geofizich skaia Observatoriia, Trudy*, No. 23(85):40–48, **1951.** 3 figs., 4 refs., 27 equations. **DLC** After a brief critical review of various methods for determining theoretically the change temperature in the lower atmospheric layer near the ground, it is concluded that the mo promising approach is the one involving solution of the equations of heat conduction give the initial distribution of temperature in the air and soil and the radiational balance. T method of the general solution of these equations and a comparison of the actual march temperature in the lower atmosphere with the theoretically calculated march are show *Subject Headings:* **1. Micrometeorology 2. Temperature variations.**—*I.L.D.*

3.6–168 551.58

†Godard, Marcelin, **Microclimats et mésoclimats du point de vue agronomique.** [Micr climates and meso-climates from an agronomic point of view.] *Annales Agronomiqu New Ser.*, 19(4):578–604, July-Aug. **1949.** 2 figs., 10 tables, 39 refs. **DA.** Abstracted fro reprint. **DWB**—A much more comprehensive treatment of the problems of agricultur climatology than was made in the author's 1944 paper (*see item* 3.6–175 below). Instrument exposure, temperature and humidity profiles, dew, wind speed, damage by ice or frost, inte ception of rainfall, temperature inversions in certain locations (frost pockets) and many oth factors beside the classical ones (temperature, radiation, soil moisture and length of day) a considered in this treatise which shows the effect of work published in Europe and Nort America during the war. *Subject Headings:* **1. Agricultural climatology 2. Microclimatolog** —*M.R.*

3.6–169 551.584.3:551.524.3

van Eimern, Josef, **Kleinklimatische Geländeaufnahme in Quickborn/Holstein.** [Micr climatic land survey in Quickborn/Holstein.] *Annalen der Meteorologie*, 4(1–6):259 269, 195 5 figs., 2 tables, 4 refs. German and English summaries p. 259. **MH-BH**—At Quickbor

ar Kiel, air temperature minima were investigated in Oct. Jan. 1949/50 by a network of nimum thermometers on the ground and in spring 1950 by a meteorograph 70–80 cm above ound, carried by a bicycle. At ground level in flat country soil conditions were more im- rtant than topography, but at 70–80 cm effect of topography was the greater. The tem- rature distribution at sunrise on May 12 was studied in detail to delineate districts with risk spring frost. *Subject Headings:* **1. Microclimatology 2. Radiation frost 3. Quickborn/Hol- ein, Germany.**—*C.E.P.B.*

3.6–170 551.584.41:632.18(438)

Molga, Marian, **O pracach z zakresu meteorologii lésnej.** [Problems in the field of rest meteorology.] *Gazeta Obserwatora PIHM*, Warsaw, 3(11):1–5, Nov. **1950. DLC**— general discussion of the most important problems and tasks facing forest meteorology in land, giving a picture of what has already been achieved in the field and what has still to be ne. The need of organizing a forest fire warning meteorological service is stressed. *Subject adings:* **1. Forest climatology 2. Fire weather forecasting 3. Micrometeorology 4. land.**—*A.M.P.*

CLIMATIC CLASSIFICATION

(*See also items:* 3.6–108, 3.6–149)

3.6–171 551.585:001

De Fina, Armando Leopoldo (*Univ. Nacional. La Plata, Argentina*), **Nueva definición e clima.** [New definition of climate.] *Meteoros*, Buenos Aires, 1(2-3):219–220, June 951. **DWB**—The author modifies his previous definition of climate (*Revista Meteorológica*, 947) in the light of many comments received since that date. The earlier definition stated hat climate was the sum total of the various daily and annual weather conditions normally curring at a point on the earth's surface. The new definition states that climate is the sum the various daily and annual conditions that the weather brings, with different frequencies a place. The latter definition allows for the importance of extremes (although very in- equent) which limit plant or animal life, and for a climatology of the free air as affecting air ansportation. *Subject Headings:* **1. Climate 2. Definitions.**—*M.R.*

3.6–172 551.585:551.582.1:551.573(931)

Garnier, Benjamin John, **Climates of New Zealand according to Thornthwaite's classifica- on.** (In: Garnier, B. J. (*ed.*), **New Zealand weather and climate.** Christchurch, New ealand, Whitcomb and Tombs, **1950.** p. 84–104. graphs, tables, diagrs., 31 refs.) Revision paper which appeared originally in *Association of American Geographers, Annals*, 36(3):151– 77, Sept. **1946. DLC**—Climatic classifications, types according to the THORNTHWAITE stem, T-E and P-E indices; correlations with vegetation and soil, local variations in types nd, finally, detailed charts of the two main islands with supporting tabular data are presented nd discussed. Based on THORNTHWAITE's 1931 system but somewhat revised after his 1943 aper. (*See item* 3.6–173 below.) *Subject Headings:* **1. Climatic classification 2. Evapo- anspiration 3. Precipitation effectiveness 4. Thermal efficiency 5. Thornthwaite's lassification 6. New Zealand.**—*M.R.*

3.6–173 551.585:551.582.1(931)

Garnier, Benjamin John, **The seasonal climates of New Zealand.** (In: Garnier, B. J. *ed.*) **New Zealand weather and climate.** Christchurch, New Zealand, Whitcomb and ombs, **1950.** p. 105–139. graphs, diagrs., refs.) **DLC**—In an attempt to provide a better escription of the climate of New Zealand than could be obtained from charts of precipitation ffectiveness or thermal efficiency (which do not show sufficient contrasts between many egions in New Zealand), the author has devised two scales of (a) moisture categories (7 lasses) and (b) thermal categories (5 classes) which he uses to construct charts for each of the easons for the two islands. This system, which he calls a "modified Thornthwaite system," hows up the contrasts in latitude, altitude, distance from sea and between the two islands uite well. Extensive discussion, nomograms for quantitative evaluation of charts and some ata are presented. (*See item* 3.6–172 above.) *Subject Headings:* **1. Climatic classifications**

2. Precipitation effectiveness 3. Thermal efficiency 4. Thornthwaite's classification 5. New Zealand.—*M.R.*

3.6–174 551.585:631.95(94)

Gentilli, J., **Two climatic systems applied to Australia.** *Australian Journal of Science* 11(1):13–16, Aug. **1948.** 2 figs., refs. **DLC**—Charts of Australian climates based on the KÖPPEN (1932) and THORNTHWAITE (1931) systems are compared and the conclusion reached that the latter system more accurately depicts the climate of regions in middle and high latitudes while the reverse is true for places in low latitudes, since KÖPPEN based his system more on tropical climates and THORNTHWAITE on conditions in middle latitudes such as the U. S. A. Features of the two are compared in detail in the light of actual ecological conditions in Australia. *Subject Headings:* **1. Climatic classifications 2. Ecology 3. Köppen's classification 4. Thornthwaite's classification 5. Australia.**—*M.R.*

BIOCLIMATOLOGY

(*See also items:* 3.6–158, 3.6–163)

3.6–175 551.586:58

Godard, Marcelin, **Le climat de la plante.** [Plant climate.] *Annales Agronomiques, Nouv. Ser.*, 14(2):200–214, April/June **1944.** 2 tables, 40 refs. Abstracted from reprint. **DWB**—Definition of bioclimatology in terms of plant ecology, followed by discussion of the various climatic factors which influence plant growth: water, soil moisture, insolation, soil and air temperature, duration of daylight, etc. Photoperiodism and microclimatic factors are also considered. Some quantitative illustrations are given. *Subject Headings:* **1. Bioclimatology 2. Plant ecology 3. Photoperiodism.**—*M.R.*

3.6–176 551.586:58:551.577.3

Rain that does not affect fires. *U. S. Forest Service, Northern Rocky Forest and Range Experiment Station, Hi-lites*, 3(13):3, July 1, **1951. MH-BH**—About one shower in three in the northern Rocky Mountain region produces too little rain to reach the surface under the forest cover. Another third of the showers produce too little rain to soak the fuel sufficiently to prevent spread of fire. A graph shows the percentage of interception of rain in relation to amount of precipitation per shower for all types of coniferous forests. For amounts $<.25$ in. $>30\%$ is intercepted. Showers up to .04 in. are completely intercepted. *Subject Headings:* **1. Forest influences 2. Precipitation effectiveness 3. Fire weather conditions 4. Northern Rocky Mountains.**—*M.R.*

3.6–177 551.586:519.241.2

Cyran, W., **Die Grenzen der Leistungsfähigkeit der n-Methode.** [The limits of applicability of the *n*-method.] *Annalen der Meteorologie, Medizin-meteorologische Hefte*, No. 5:24, **1951. MH-BH**—The selection of a critical *day* is not sufficiently exact as many meteorological processes can occur in a day. Biological processes must be timed to at least an hour and the *n*-method applied to one third or quarter days. *Subject Headings:* **1. Bioclimatology 2. Statistical techniques 3. *n*-method.**—*C.E.P.B.*

3.6–178 551.586:519.241.2

Cyran, W., **Zur Untersuchungsmethodik auf Meteorotropie.** [On investigation technique into meteorotropy.] *Annalen der Meteorologie, Medizin-Meteorologische Hefte*, No. 6:1–8, **1951.** table, 16 refs. **MH-BH**—Hitherto, the usual daily form of *n*-method has not shown a clear, statistical relation between e.g. embolism and weather, and if the phenomenon is too frequent, it is inapplicable. Average duration of frontal phenomena is 5.6 hours and author advocates *n*-method with 8 hour periods instead of days. Still better is the "individual" method in which frequency during actual duration of the weather phenomenon is compared with those before and after. Example proves association of beginning of labor pains with weather influence. *Subject Headings:* **1. Bioclimatology 2. *n*-method.**—*C.E.P.B.*

3.6–179 551.586:581.056

*Agostinho, José, **Clima e vegetação.** [Climate and vegetation.] *Açoreana*, Angra do Heroísma, Azores, 4(2), **1947.** 33 p. tables, graphs. Abstracted from reprint. **DWB**—Monthly data on mean daily temperature and relative humidity, absolute temperature, mean vapor pressure and precipitation for Ponta Delgada (Relvao), Veredar, Angra do Heroismo (Santa Luzia) and Achade das Furnas are given. The author discusses the relationship between climate and vegetation and develops an index of precipitation. *Subject Headings:* **1. Climatic influences 2. Plant ecology 3. Azores.**—*I.L.D.*

3.6–180 551.586:628.8

Bastamov, S. L., Topol'nitskii, N. M. and Fomin, N. P., **O laboratoriiakh isskustvennogo klimata.** [Artificial climate laboratories.] *Meteorologiia i Gidrologiia*, No. 4:35–38, Dec. **1950.** equations. **DLC**—In connection with the recent construction of two new stations of artificial climate for the development of frost and drought resistant fruit and citrus trees and berry plants, the authors describe laboratories already existing in the U.S.S.R. and analyze the results obtained. Specific investigations on snow drifting and temperatures and evaporation from the soil are outlined. *Subject Headings:* **1. Climatic laboratories 2. Artificial climates 3. Snow surveys 4. U.S.S.R.**—*A.M.P.*

ENVIRONMENTAL INFLUENCES

(*See also item:* 3.6–104)

3.6–181 551.588.1

Holm, Karl-Friedrich, **Zur Frage der thermischen Kontinentalität.** [On the question of thermic continentiality.] *Petermanns Geographische Mitteilungen*, 94(4):197–201, **1950.** 3 figs., 3 tables, 26 refs. **DLC**—After discussing various expressions for continentality *k*, author examines secular change. In Schleswig-Holstein *k* by ZENKER's formula (based on annual range of temperature) decreased after 1910. A map of all Germany shows that decrease was greatest in S.W. Decrease is attributed by various authors to increased strength of atmospheric circulation. Thermic continentality is greater in towns than open country. *Subject Headings:* **1. Thermal continentality 2. Germany.**—*C.E.P.B.*

SYNOPTIC CLIMATOLOGY

(*See also item:* 3.6–136)

3.6–182 551.589.1(436)

Lauscher, Friedrich, **Dynamische Klimaskizze von Vorarlberg (Nordalpen).** [Sketch of dynamic climatology of Vorarlberg (Northern Alps).] *Wetter und Leben*, 3(8):166–169, Aug., **1951.** 3 tables. **MH-BH** Vorarlberg in north Alpine margin is exposed to N.W. winds. Rain days and amounts are classified according to synoptic type; highest percentage comes with W. or N.W. weather, next with cyclonic type, especially a trough crossing central Europe W-E. *Subject Headings:* **1. Dynamic climatology 2. Vorarlberg, Austria.**—*C.E.P.B.*

MISCELLANEOUS APPLICATIONS

OPTICAL PHENOMENA

(*See also items:* 3.6–99, 3.6–119)

3.6–183 551.593.51

Sharonov, V. V., **Novye dannye o "zelenom luche."** [New data on the "green flash."] *Priroda*, Moscow, No. 7:50–53, July **1951.** 3 figs., 9 refs. **MH-BH**—The first rays of sun at sunrise or the last at sunset are sometimes an intense blue-green color resembling that color in the spectral band of wave-length about 530μ. After vainly watching for the green flash for 30 years, the author finally observed it repeatedly 20 times from May 16 to June 10, 1950, at Sochi on the Black Sea, with the aid of power binoculars provided with gray light filters. Green flashes appear exclusively in sunsets in the "aigrette" form, sometimes repeatedly up to

7 times with intervals from 5 sec. to 2 min. Such repeated flashes are connected with the deformation of the sun disk. After giving a detailed description of an example of deformation of the disk of the setting sun with a multiple (5 times) green flashing, together with a graph of its multiple deformations, the author discusses the possible causes of its origin, discards the existing hypotheses and asserts that the observed phenomena speak in favor of a certain monochromatic character of the green flash based upon the phenomenon of anomalous dispersion of light. *Subject Headings:* **1. Green flash 2. Sochi, U.S.S.R.**—*A.M.P.*

3.6–184 551.593.51

Simmons, R. E. G., **Observations of the green flash.** *Institute of Navigation, Journal*, 4(4):415–417, Oct. **1951.** 3 figs. **DWB**—Brief account of causes and general description of observations of blue or green flash at sunset and from moon. *Subject Heading:* **1. Green flash.** —*C.E.P.B.*

3.6–185 551.593.54 551.521.31 551.521.12(98)

*Olsson, H. and Schüepp, Walter, **Die atmosphärische Trübung in Spitzbergen.** [Atmospheric turbidity in Spitsbergen.] *Geografiska Annaler*, 32(3–4):210–219, **1950.** 2 figs., 5 tables, refs. **MH-BH**—Actinometric and psychrometric data for the summer of 1934, obtained on Isachsen-Plateau in west Spitsbergen, are used to compute various parameters of atmospheric transparency in different wave lengths, water vapor content, turbidity coefficient, etc. Comparisons are made with other latitudes and diurnal changes in radiation intensity in different wave lengths and aspects made graphically. *Subject Headings:* **1. Atmospheric transparency 2. Turbidity 3. Insolation 4. Spitsbergen.**—*M.R.*

3.6–186 551.593.6

Janiszewski, Feliks, **Wience.** [Coronas.] *Gazeta Obserwatora PIHM*, Warsaw, 3(10):8–10, Oct. **1950.** 2 figs. **DLC**—Lunar and solar coronas, Bishop's ring, glories (Brocken bows) and iridescence of clouds are described and their origin is explained in a non-technical manner. *Subject Headings:* **1. Coronas 2. Optical phenomena.**—*A.M.P.*

3.6–187 551.593.63

Hamilton, R. A., Ronxin, J. T. and Parry, A. P., **Halo phenomena at Prestwick, August 31, 1951.** *Meteorological Magazine*, London, 80(954):359–360, Dec. **1951.** fig. **MH-BH**—Included weak 22° halo, bright upper tangent arc, parhelic circle with 4 parhelia, anthelic arcs and anthelion, and iridescent cloud. *Subject Headings:* **1. Halo observations 2. Parhelia.**—*C.E.P.B.*

PART II. ANNOTATED BIBLIOGRAPHY ON STRATUS FORECASTING

By: *Gerald C. Bristow*

EXPLANATORY NOTE

The principal emphasis of this bibliography is on stratus clouds and forecasting with particular reference to the type of stratus which occurs along the California coast. A few studies of historical interest are included to show the evolution of our present understanding. We have attempted to look at other parts of the world with similar conditions, principally places with subtropical subsidence of the atmosphere and with cold upwelling of ocean water. VON FICKER'S classical, although now somewhat old, study of the Atlantic trade inversion still gives the best large scale view of the effect of subtropical subsidence.

The close interrelation between stratus and fog has determined the inclusion of many items where the principal emphasis is on fog but where light is shed on the stratus problem as well. Since original studies are considered more important for this bibliography, few references are made to what may be called textbooks; but enough, we hope, so that these valuable sources of information are not overlooked. Cloud physics (which was the subject of a bibliography in *Meteorological Abstracts*, Vol. 1, No. 3, March 1950), although closely related to some aspects of our general problem, has not been included except for a few items on transmission of solar energy.

It should be noted that because the June issue contains an extra *cumulative index*, we have chosen to publish an unusually short *special bibliography*. It is hoped that in spite of its briefness it will prove just as useful as longer bibliographies have.

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BIBLIOGRAPHY ON STRATUS FORECASTING

1903

3F–1 551.576 551.582

McAdie, Alexander, **Climatology of California.** *U. S. Weather Bureau, Bulletin L,* **1903.** 270 p. charts, diagrs. **DWB**—In describing the San Francisco fogs, the author attributed the strong fog-bearing sea breeze to the heating of the interior valleys. He anticipated the trade inversion: "Fog seems to occur at times of steep inverted gradients; in other words, when the temperature of the 2500 ft level [he had Mt. Tamalpais data] is considerably higher than at sea level." Dean Blake considered this to be the first serious attempt to explain California stratus. *Subject Headings:* **1. Climate of California 2. California stratus 3. Trade inversion 4. California Coast 5. Mt. Tamalpais, California.**

1916

3F–2 551.575/6

Wright, Herbert H., **Fog in relation to wind direction on Mount Tamalpais, Cal.** *Monthly Weather Review,* 44(6):342–344, June **1916.** 3 tables. **DWB**—Summer sea fogs can be seen from Mount Tamalpais some 20 miles to sea. With an assisting pressure gradient this fog will move inland over the coastal area with the sea breeze. This usually occurs in the afternoon. Fogs seldom form in air moving from the continent because such air is dry. It was noticed that high temperatures aloft usually precede and accompany fog. *Subject Headings:* **1. Fog 2. California stratus 3. San Francisco Bay 4. Mt. Tamalpais, California.**

1917

3F–3 551.576.1

Douglas, C. K. M., **On the causes of the formation of anticyclone stratus as observed from aeroplanes.** *Royal Society of Edinburgh, Proceedings,* 37:137–148, **1916–1917.** figs., tables. **DWB**—From airplane flights over northwest Europe, the author notes the formation of stratus under an inversion in anticyclones. The warm air aloft is attributed either to a westerly component aloft or to the underrunning of cold air ar the surface. *Subject Headings:* **1. Stratus cloud formation 2. Northwest Europe.**

3F–4 551.575.2(794)

Palmer, Andrew H., **Fog along the California coast.** *Monthly Weather Review,* 45(10):496–499, **1917.** fig., 2 tables. **DWB**—The author gives the locations of fog signal stations along the California coast and the number of hours each month the signals operated from September 1916 through August 1917. There is a brief description of summer and winter type fogs. *Subject Headings:* **1. Fog distribution 2. California Coast.**

3F–5 551.575.1

Taylor, G. I., **The foundation of fog and mist.** *Royal Meteorological Society, Quarterly Journal,* 43:241–268, **1917.** 16 figs., 3 tables. **DLC**—The author considers smoke and dust in the air as forms of fog, and shows that for a smoke fog there must be little wind and an inversion with cold air at the surface. To explain water droplet fog he constructs a moisture diagram, that is, vapor pressure against temperature, and on this draws a saturation line. He shows how cooling or the mixing of saturated air at different temperatures produces supersaturation and consequently fog. Sea fogs over the Grand Bank he finds by soundings and trajectories to be due to the cooling of warm, moist air by the cold sea surface. He found 20% of the fogs, however, had air temperature below sea surface temperature. In the study of land radiation fogs at Kew, fogs formed with wind speed below 5.5 m.p.h. most frequently. To forecast fogs at Kew, a fog expectation diagram was constructed with dry bulb × dif. dew point at 8 p.m. on which fog occurrences were plotted. A more

practical diagram with dry bulb ×wet bulb depression with fog expectancy lines was also constructed. *Subject Headings:* **1. Fog formation 2. Fog forecasting 3. Grand Bank, Newfoundland 4. Kew, England.**

1920

3F–6 551.576

Varney, Burton M., **Fog phenomena of the San Francisco Bay.** *Monthly Weather Review*, 48:337–338, **1920.** fig. **DWB**—An explanation of a local stratocumulus bank along the eastern shore of San Francisco Bay by convective interaction. *Subject Headings:* **1. California stratus 2. San Francisco Bay, California.**

1921

3F–7 551.576.1:551.556:551.46

Bobzin, Ernst, **Vergleichende Betrachtung des Klimas und der kalten Auftriebströmungen an der südwestafrikanischen und südarabischen Küste.** [Consideration of the climate and the cold upwelling currents on the southwest African compared with the south Arabian coasts.] *Hamburg, Deutsche Seewarte, Deutsche Überseeische meteorologische Beobachtungen*, No. 23, Pt. H, **1921.** 18 p. 10 tables, 42 refs. **DWB**—By comparing the wind regime of the Arabian Sea with that over the southwest coast of Africa, the author explains the cool summer waters from Cape Guardifui eastward along the south Arabian coast as caused by upwelling largely due to prevailing winds. Presumably this would cause summer stratus and possibly fog. Average sea surface temperature (1903–1914), extreme monthly maximum and minimum temperatures (1906–1914) and wind direction and speed (1907–1912) for Swakopmund are given. (*Same item* as 2F–63 in June 1951 *Meteorological Abstracts.*) *Subject Headings:* **1. Stratus cloud formation 2. Wind effects 3. Upwelling 4. Southwest African Coast 5. South Arabian Coast.**

1923

3F–8 551.574.1

Aitken, John, **Collected scientific papers.** Cambridge, University Press, **1923.** 591 p. figs., tables. **DLC**—A collection of the more important papers of John Aitken including his pioneer work on nuclei. *Subject Headings:* **1. Condensation nuclei 2. Nuclei counters.**

3F–9 551.524.7

Wyatt, B. H., **Synopsis of paper on temperature and humidity aloft relative to the pressure gradient over the southwest portion of California.** *American Meteorological Society, Bulletin*, 4:154–156, Nov. **1923.** **DWB**—"A high pressure area to the northeastward of the station (San Diego) is usually accompanied by . . . a marked inversion of temperature. . . ." *Subject Headings:* **1. Upper air temperatures 2. Temperature inversions 3. San Diego, California.**

1924

3F–10 551.575.36

Bilham, E. G., **Pressure type in relation to fog frequency at Scilly during summer months.** *Great Britain, Meteorological Office, Professional Notes*, 3(37):173–180, **1924.** **DWB**—A tabulation of occurrences of fog ("f" in Daily Weather Report) at St. Mary's, Scilly, by barometric orientation for the months June, July and August 1905–1918. The use of pressure type alone for forecasting would not be successful but can be used with other factors to indicate the occurrence of fog. The type most frequently giving fog at Scilly, or some place near on the coast, was high pressure with several small maxima over the British Isles and northern Europe. *Subject Headings:* **1. Fog frequencies 2. Scilly Isles, England.**

1926

3F–11 551.509:551.575

Blake, Dean, **Forecasting fog in the California coast.** *California, University, Scripps Institution of Oceanography, Bulletin*, 12:28–33, **1926.** **DWB**—Gives a brief summary of ideas that have been used in forecasting and explaining California coastal fogs up to that time. *Subject Heading:* **1. Fog forecasting.**

3F–12 551.524.4

von Ficker, Heinrich, **Temperatur und vertikale Temperaturabnahme auf Teneriffa.** [Temperature and vertical temperature decrease on Tenerife.] *Annalen der Hydrographie und Maritimen Meteorologie, Köppenheft*, Sept. **1926.** p. 27–32. 2 figs., 3 tables. **DWB**—Corrected monthly means of temperature are tabulated for 13 stations 10–3700 m and the decrease of temperature per 100 m height calculated on S.E. and N. sides. In summer (trade wind period) the decrease is very

rapid between 0–330 and 2700–3700 m, with an inversion 330–547 m. (*Same abstract* as No. 2K–78 in Nov. 1951 *Meteorological Abstracts.*) *Subject Headings:* **1. Mountain meteorology 2. Temperature inversions 3. Tenerife, Canary Islands.**—*C.E.P.B.*

1927

3F–13 551.575:656.6

Hurd, Willis Edwin. **Fog at sea.** [Washington, D. C., **1927.**] Also in: *U. S. Hydrographic Office Pilot charts of the upper air North Atlantic Ocean*, March **1940. DWB**—A description of fog at sea from the mariner's viewpoint. Distribution, season and frequency of fog, quotations from ships' logs of fog experiences and other specific instances are given. *Subject Headings:* **1. Fog 2. Pilot guides. I. U. S. Hydrographic Office II. U. S. Weather Bureau.**

1928

3F–14 551.524.4 551.553

*Blake, Dean. **Temperature inversions at San Diego as deduced from aerological observations from airplane.** *Monthly Weather Review*, 56:221–224, **1928.** fig., 3 tables. **DWB**—A first compendium of apob data for this area. Frequency and average height of the inversion, distribution of winds by direction at various heights, and speculation as to the origin of the cool and warm air are given. *Subject Headings:* **1. Temperature inversions 2. Wind distribution 3. San Diego, California.**

3F–15 551.575.1

Entwistle, F., **Fog.** *Royal Aeronautical Society, Aeronautical Reprints*, No. 28, **1928.** 45 p. 23 figs., 3 tables, 13 refs. **DWB**—A discussion of the principal factors causing fog with illustrative figures and synoptic maps of northwest Europe. A few suggestions on forecasting are given. *Subject Headings:* **1. Fog formation 2. Europe.**

3F–16 551.575(02)

Willett, Hurd Curtis. **Fog and haze, their causes, distribution and forecasting.** *Monthly Weather Review*, 56:435–468, **1928. DWB**—A lengthy and careful analysis of fog. Classification is based on the frontal air mass system. This study is used as the conventional textbook presentation of fog. *Subject Headings:* **1. Fog 2. Haze.**

1930

3F–17 551.575

Byers, Horace R., **Summer sea fogs of the California coast.** *California, University, Publications in Geography*, 3(5):291–338, **1930.** 13 figs., 11 tables, 34 refs. **DWB**—A study of the best data then available on California summer sea fog, the conditions on land and ocean favoring the formation of fog, fog distribution and temperatures aloft. *Subject Headings:* **1. Fog 2. California stratus 3. California coast.**

3F–18 551.575:551.521.3

Douglas, C. K. M., **Cold fogs over the sea.** *Meteorological Magazine*, London, 65:133–135, **1930. DWB**—An attempt to explain air temperatures below sea temperatures in a fog over the sea by radiation from the fog. *Subject Headings:* **1. Fog 2. Radiation.**

3F–19 551.501.7:551.507.352

Ernst, Wilhelm and Seilkopf, Heinrich. **Meteorologische Beobachtungen auf dem Las Palmas-Flug der deutschen Luft Hansa Juni und Juli 1928.** [Meteorological observations during a flight of the German Luft Hansa to Las Palmas.] *Aus dem Archiv der Deutschen Seewarte*, 48(4), **1930.** 25 p. 6 figs. **DLC**—Discussion and interpretation of observations made on a flight from Pisa, Italy to Cadiz, Spain, to Las Palmas, Canary Island and return along the African coast, Cadiz, Lisbon and ending at Travemünde, Germany. Fog and stratus conditions along the coast as well as the trade winds, trade inversion and dust from Africa were carefully observed and reported. *Subject Headings:* **1. Airplane weather reconnaissance 2. Fog 3. Stratus clouds 4. Eastern North Atlantic.**

3F–20 551.575.1

Hennessy, J., **Wind, fog and mist approaches to Table Bay.** *Marine Observer*, 27:129, **1930. DWB**—Summer fogs are caused at Table Bay by the advection of warm moist air (NW wind) over the cold water close to shore. *Subject Headings:* **1. Fog formation 2. Table Bay, South Africa.**

3F–21 551.575 551.509.3

Willett, Hurd Curtis, **Synoptic studies in fog.** *Massachusetts Institute of Technology, Meteorological Papers*, 1(1), **1930.** 37 p. 17 maps, table. **DWB**—The occurrence of fog at Hadley Airport (between Philadelphia and New York) was typed by WILLETT's scheme (*see item* No. 3F–16 above) and the associated synoptic situations studied. Note is made of the trajectory of the air previous to the formation of fog in it and the modification of the air along this trajectory. *Subject Headings:* **1. Fog 2. Synoptic studies 3. Hadley Airport, New Jersey.**

1931

3F–22 551.576 551.524.4

Anderson, Joseph B., **Observations from airplanes of cloud and fog conditions along the southern California coast.** *Monthly Weather Review*, 59:264–270, **1931. DWB.** Summary in: *American Meteorological Society, Bulletin*, 12:107–108, **1931. DWB**—A detailed description of instrumental and non-instrumental observations made during regular and special airplane flights near San Diego in 1929. Special note was made on the inversion, the extent and formation of stratus and fog and sources of air aloft. Although few numerical data are given, the description is clear and pertinent. *Subject Headings:* **1. California stratus 2. Temperature inversions 3. San Diego, California.**

3F–23 551.575

Byers, Horace R. and Lockhart, Wilbur M., **Characteristic weather phenomena of California.** *Massachusetts Institute of Technology, Meteorological Papers*, 1(2), **1931.** 54 p. 22 plates, 20 figs., 10 tables. **DWB**—This paper is divided into five parts. The first gives the general physical and climatic features and their relations. The second is a detailed description of maritime air and accompanying fog in the Central Valley 20–24 Dec. 1928. The third part is on summer sea fogs: the essentially similar nature of fog and stratus, the coast affected, the late summer maximum, the essential conditions to formation such as cold water, onshore pressure gradient, turbulence, light wind and inversion, and the evaporation of fog principally from radiant energy absorbed or transmitted to the ground. The fourth part is on the movement of fronts across California, and the fifth on the föhn of March 3, 1929 in the San Francisco Bay region. *Subject Headings:* **1. Winter fog 2. Summer fog 3. California stratus 4. Frontal movement 5. Föhn winds 6. San Francisco Bay Region, California.**

3F–24 551.575:551.524.4

Heywood, G. S. P., **Some observations on fogs and the accompanying temperature gradients.** *Royal Meteorological Society, Quarterly Journal*, 57(238):97–101, Jan. **1931.** 2 figs., table. **DWB**—The table shows the height of the large inversion during 55 fogs at Leafield, Oxfordshire, 1929–30, estimated by the 300 ft mast. The temperature structure up to 300 ft is discussed and illustrated. *Subject Headings:* **1. Fog 2. Temperature inversions 3. Leafield, England.**—*C.E.P.B.*

3F–25 551.575:551.465

*Knoche, Walter, **Nebel und Garúa in Chile.** [Fog and drizzle in Chile.] *Gesellschaft für Erdkunde zu Berlin, Zeitschrift*, No. 3/4:81–95, **1931.** 2 figs., 4 tables, refs. **DWB**—Description of fog and drizzle, an especially thick wet fog, and their incidence with illustrating charts and tables. Stratus and stratocumulus form over the Humboldt Current sometimes break along the coastal water, forming again over the coast to the mountains. The tables give number of days with fog, drizzle and dust from records of one to ten years. *Subject Headings:* **1. Fog frequencies 2. Cold currents 3. Humboldt Current 4. Chile.**

3F–26 551.521.3:551.591

Stratton, J. A. and Houghton, H. G., **A theoretical investigation of the transmission of light through fog.** *Physical Review*, New York, 38:159–165, **1931. DWB**—"This theoretical investigation was undertaken in an attempt to explain some unexpected experimental results which are described in detail in another paper. The fog droplets are assumed to be dielectric spheres with an index of refraction of 1.33 and the development is based on the work of MIE and DEBYE on the pressure of light and the colors of colloidal solutions. The results show that the particle size of the fog is a controlling factor in the transmission characteristics of the fog. By assuming the appropriate particle size a theoretical transmission curve is obtained which closely corresponds to the experimental data. In conclusion, it is pointed out that the KING formula is not applicable to the scattering of light by particles as large as fog drops." *Subject Headings:* **1. Fog 2. Stratus clouds 3. Transmission of light.**

1932

3F–27 551.575.36

*Tsukada, K., **On the sea fog in the North Pacific Ocean.** *Geophysical Magazine*, Tokyo, 6:147–164, **1932.** 5 figs., 4 tables. **DWB**—A statistical investigation of fogs in the North Pacific Ocean. *Subject Headings:* **1. Fog frequencies 2. North Pacific Ocean.**

1933

3F–28 551.524.4

*Blake, Dean, **Remarkably low humidities over San Diego.** *Monthly Weather Review*, 61:170, **1933. DWB**—Note of 7 days in June 1932 when humidities under 4% were recorded in the warm, dry air just above the inversion. On each of these mornings stratus occurred below inversion but dissipated by 10 a.m. Winds aloft, temperatures and humidities for various levels on June 13, 15, 21 and 22, 1932 are given. *Subject Headings:* **1. Temperature inversions 2. San Diego, California.**

3F–29 551.576:551.515.8

Bowie, Edward H., **The summer nighttime clouds of the Santa Clara Valley, California.** *Monthly Weather Review*, 61:40–41, **1933.** table. **DWB**—Describes the nightly formation of stratus clouds over the Santa Clara Valley when this valley is flooded by marine air and the layer next above is warm and dry. *Subject Headings:* **1. California stratus 2. Maritime air masses 3. Santa Clara Valley, California.**

3F–30 551.576:551.465

Knoche, Walter. **Die westerliche Wolkenbank an der chilenischen Kueste.** [Westerly cloud bank on the Chilean coast.] *Meteorologische Zeitschrift*, 50:70, Feb. **1933. DWB**—A brief description of clouds off the north Chilean and Peruvian coast as related to the Humboldt Current. *Subject Headings:* **1. Coastal clouds 2. Cold currents 3. Humboldt Current 4. Chile 5. Peru.**

3F–31 551.575/6:629.3

Mézin, Maurice, **Note sur la hauteur des surfaces supérieures des bancs de brouillard.** [Note on the height of upper surfaces of fog layers.] *La Météorologie*, 9:100–102, **1933. DWB**—From data for a limited number of places in northern Europe where observations were obtainable, the author concludes that if the upper surface of a fog or cloud is more than 600 m above the surface, the layer is stratus and the ground will be visible for landing aircraft. *Subject Headings:* **1. Fog 2. Stratus clouds 3. Aeronautical meteorology 4. Northwest Europe.**

3F–32 551.515.72

Reed, T. R., **The North American high level anticyclone.** *Monthly Weather Review*, 61:321–325, **1933.** 36 maps. **DWB**—Summer circulation aloft over southwestern United States. Blake (*see* 3F-34 below) considered that this accounted for the warm, dry air above the inversion below which stratus form. *Subject Headings:* **1. Pressure 2. Upper air winds 3. United States.**

3F–33 551.575 551.576

Varney, Burton M., **Fog phenomena of the piedmont littoral west of Los Angeles.** *American Meteorological Society, Bulletin*, 14:125–126, **1933. MH-BH**—A short description of advection and radiation fogs on the piedmont slope between Santa Monica mountains and Santa Monica Bay. *Subject Headings:* **1. Fog 2. California stratus 3. Santa Monica, California.**

1934

3F–34 551.576.1:551.524.4

Blake, Dean, **Further conclusions from additional observations in free air over San Diego.** *Monthly Weather Review*, 62:195–199, **1934.** 6 tables. **DWB**—A review is made of previous ideas on the processes involved in the moist summer inversion and warm air aloft, and evaluation made in the light of additional data. The conclusion is reached that: 1) clouds form near the top of the inversion which is cooled by radiation, build downward at night and dissipate upward by day and 2) the overlying stratum is usually the result of subsidence of air from the interior, brought to the California coast by the high level anticyclone centered to the eastward. *Subject Headings:* **1. California stratus 2. Subsidence inversion 3. San Diego, California.**

3F–35 551.515.8

Cook, A. W., **Marked summer air mass displacements in California and their effects on weather.** *Monthly Weather Review*, 62:39–45, **1934.** 4 figs., 4 tables. **DWB**—A detailed description of the

movement of maritime air through the Golden Gate passage into the Interior Valley of California on August 12–16, 1933. *Subject Headings:* **1. Maritime air masses 2. Golden Gate, California.**

3F–36 551.576

Douglas, C. K. M., **The physical processes of cloud formation.** *Royal Meteorological Society, Quarterly Journal*, 60:333–341, **1934. DLC**—In eddy cloud sheets, moisture is carried up to cloud level by turbulence. Radiation has no tendency to form a discontinuity. Stratocumulus layers over the British Isles generally come from the sea. Stratus (lifted fog) is due to surface cooling combined with turbulence. The discontinuity at the top of stratus is not necessarily an inversion. A large inversion is usually due to subsidence. *Subject Headings:* **1. Stratus cloud formation 2. British Isles.**

1935

3F–37 551.521.31:551.575

Foitzik, Leonhard, **Ueber die spektrale Lichtdurchlaessigkeit von Naturnebeln.** [On the spectral transmission of light through natural fogs.] *Meteorologische Zeitschrift*, 52:458–460, **1935.** 5 figs. **DWB**—Using a Pulfrich photometer and red, green and blue filters, light measurements were made in natural fog and dust haze to determine the penetrating power of the different wavelengths of light. No general conclusions were reached. *Subject Headings:* **1. Fog 2. Light penetration.**

3F–38 551.524.4

Lockhart, W. M., **The west coast inversion and its relation to ocean weather forecasting in southern California.** *American Meteorological Society, Bulletin*, 16:226, **1935. MH-BH**—Resume of paper describing high type and low type inversion, the low being more common and associated with stratus. Inversions were noted extending several hundred miles to sea. *Subject Headings:* **1. Temperature inversions 2. Ocean weather forecasting 3. Southern California.**

1936

3F–39 551.509.51 551.575.1

Petterssen, Sverre, **On the causes and forecasting of the California fog.** *Journal of the Aeronautical Sciences*, New York, 3:305–309, **1936. DLC.** Also in: *American Meteorological Society, Bulletin*, 19:49–55, **1938.** 3 figs., 3 tables. **DWB**—An important paper on the California fog and stratus problem. The role of sea surface temperature and the upper level anticyclone is evaluated. The origin, structure and properties of the air involved are discussed. Using STEFAN'S law and BRUNT'S equation, the author concludes that differential radiation tends to maintain an inversion. Since the fog (or stratus) forms beneath the inversion through convection, the thickness between the condensation level and the base of the inversion gives a good indication of the breaking time ($r = 0.84$). The author indicates the most fruitful aids to forecasting should come from a study of factors affecting the base of the inversion, condensation level, diurnal temperature variation. (*Same item* as No. 3E-31 in May 1952 *Meteorological Abstracts.*) *Subject Headings:* **1. Fog formation 2. Fog forecasting 3. Temperature inversions 4. California stratus 5. California.**

3F–40 551.575.6

Stone, Robert Granville, **Fog in the United States.** *Geographical Review*, New York, 26(1):111–134, Jan. **1936.** 4 figs., refs., table. **DWB**—A general review of the occurrence of fog and stratus in the United States considered from regional, type and seasonal incidence standpoints. Fog regimes are rather finely divided, some 57 varieties are described for U. S. and adjacent areas. *Subject Headings:* **1. Fog distribution 2. Stratus clouds 3. United States.**

3F–41 551.576.1

Vernon, Edward M., **The diurnal variation in ceiling height beneath stratus clouds.** *Monthly Weather Review*, 64:14–16, **1936.** 5 figs. **DWB**—A recapitulation of the causes of formation and dissipation of summer fog and stratus in San Francisco Bay region. The diurnal ceiling variation is explained mostly in terms of radiation. *Subject Headings:* **1. California stratus 2. Ceiling height forecasting 3. San Francisco Bay, California.**

3F–42 551.555.1:551.524.4

von Ficker, Heinrich, **Die Passatinversion.** [Trade inversion.] *Berlin, Universität, Meteorologisches Institut, Veröffentlichungen*, 1(4), **1936.** 33 p. 15 figs., tables, 8 refs. **DWB**—This is to date the classical study on the trade inversion. Using all available data for the North and South Atlantic oceans three tentative conclusions were reached: the trade inversion extends from about 35°N to 30°S and from the eastern boundary of the ocean to about 45°W. The bottom of the inversion is highest near the equator (over 2000 m) and the lowest off the African coast about 15°–

20°N and S (below 500 m). The amount of the inversion is over 5°C in the Cape Verde Islands area, 8°C near the African coast at 20°S, and about 1°C near the equator. The maximum temperature above the inversion averages above 22°C around the Cape Verde Islands. The difference in humidity between the bottom and the top of the inversion varies from about 20% near the equator to 60% near the Canary Islands and 70% south of St. Helena. The temperature gradient in the first 500 m is generally above 1°C per 100 m from 20°N to 30°S. Processes affecting the formation and dissolution of the inversion, the effect of the Sahara coast, and the importance of the inversion in the heat balance of the earth are discussed. Barasoain Oderiz (*see* 3F–69 below) and others have shown that stratus may form below this inversion. *Subject Headings:* **1. Trade inversion 2. Atlantic Ocean**

1937

3F–43 551.575.61

George, Joseph Johnson and Bradley, William, **A semiquantitative method of forecasting summer stratus in North American Tropical marine air.** *Monthly Weather Review*, 65:43–46, **1937.** 4 figs., table, 7 refs. **DWB**—A discussion of the relations between inversion, turbulence and wind velocity to the formation of stratus and fog in tropical maritime air in eastern U. S. *Subject Headings:* **1. Stratus cloud formation 2. Fog formation 3. Maritime air masses 4. Eastern United States.**

3F–44 551.576.4:551.511

Jacobs, Woodrow C., **Atmospheric waves on isentropic surfaces as evidenced by interfrontal ceiling oscillations.** *Monthly Weather Review*, 65(1):9–12, Jan. **1937.** fig., table, 8 refs., 6 equations. **DWB**—Two occasions of rapid fluctuations of ceiling height at San Diego, Cal., were carefully observed and explained as waves caused by shearing winds on a discontinuity surface. The data for one occasion are analyzed mathematically. Air and water waves are compared with the conclusion that water waves of the same energy as the air waves observed would be ripples 22.8 mm and 34.6 mm high on the two occasions investigated. Ceiling variations average 22.8 m and 34.6 m, respectively. *Subject Headings:* **1. California stratus 2. Ceiling height variations 3. San Diego, California.**

3F–45 551.509.51:551.575.1

Krick, Irving P., **Forecasting the dissipation of fog and stratus clouds.** *Journal of the Aeronautical Sciences*, New York, 4:366–371, **1937.** **DWB**—A method of forecasting the time of breaking of stratus is described using cloud thickness, temperature at the top of the cloud layer, surface temperature which raised adiabatically would equal temperature above cloud layer, and the diurnal temperature march. The method, suggested by Petterssen (*see item* No. 3F–39 above), gives good results when conditions are not changing. *Subject Headings:* **1. Stratus dissolution forecasting 2. Fog forecasting.**

3F–46 551.576

Wood, Floyd B., **The formation and dissipation of stratus clouds beneath turbulence inversion.** *Massachusetts Institute of Technology. Meteorological Course. Professional Notes*, No. 10, Dec. **1937.** 27 p. 13 figs. Summary in: *American Meteorological Society, Bulletin*, 19:97–103, **1938.** **DWB**—The humidity distribution and the diurnal heat balance within the turbulence layer are considered and the conclusion reached that the number of hours of sunshine required to dissipate the stratus layer is roughly proportional to the thickness of the cloud layer. *Subject Headings:* **1. Stratus cloud formation 2. Stratus cloud dissolution.**

1938

3F–47 551.509.65

Houghton, Henry G. and Radford, W. H., **On the local dissipation of natural fog.** *Papers in Physical Oceanography and Meteorology*, 6(3), Oct. **1938.** 63 p. figs., tables. **DWB**—A description of the factors that enter into the problem of the artificial dissipation of fog over selected small areas. Details of experimental use of $CaCl_2$ spray and dust are described. (*Same item* as No. C–118 in March 1950 *Meteorological Abstracts.*) *Subject Headings:* **1. Fog 2. Artificial fog dissipation.**

3F–48 551.575.1:551.501

Houghton, Henry G. and Radford, W. H., **On the measurement of drop size and liquid water content in fogs and clouds.** *Papers in Physical Oceanography and Meteorology*, 6(4), **1938.** 31 p. figs., tables, 27 refs. **DWB**—A short review of methods of measuring drop size in fog with references to the original papers given. A microscopic method of measuring drop size is described and typical results given. In a sample, the modal size was about 38μ in diameter. The instrument developed for measuring the water content of foggy air was a unit consisting of a succession of ordinary wire

screens through which a motor driven fan forces air at a measured rate. The water collected was measured. Liquid water content of samples taken ranged up to 0.25 g/m³ and the number of drops per cc of foggy air was usually less than five. Water content and drop size both affect visibility. (*Same item* as No. I–38 in Sept. 1950 *Meteorological Abstracts.*) *Subject Headings:* **1. Fog 2. Drop size measurement.**

3F–49 551.509.5:551.575:632.187

Lothman, A. A., **Fog forecasting for fire control in Southern California.** *Monthly Weather Review*, 66:134–135, **1938.** 2 figs. **DWB**—The double inversion must be considered in forecasting fog in Southern California inland from the coast such as at Pasadena and Burbank. *Subject Headings:* **1. Fog forecasting 2. Stratus cloud forecasting 3. Fire weather forecasting 4. Southern California.**

3F–50 551.576:551.509.5

Poulter, R. M., **Cloud forecasting; the daily use of the tephigram.** *Royal Meteorological Society, Quarterly Journal*, 64:277–292, **1938.** 10 figs., ref. **DLC**—Suggestions on the use of the tephigram for cloud forecasting in England. North Sea stratus is considered but only in those months when the sea temperature is above the air temperature. If there is no inversion above the North Sea, surface air convection proceeds to the point of producing showers. *Subject Headings:* **1. Cloud forecasting 2. Tephigrams.**

3F–51 551.57

Simonet, R., **Le brouillard sur la côte marocaine.** [Fog on the coast of Morocco.] 71e *Congrès des Sociétés Savantes de Paris*, **1938.** p. 123–126. Unchecked.—There is a minimum of fog in the spring, a maximum in summer, and, on the north coast, a secondary maximum in winter. *Subject Headings:* **1. Fog 2. Morocco.**

1939

3F–52 551.576.1

Petterssen, Sverre, **Some aspects of formation and dissipation of fog.** *Geofysiske Publikasjoner*, 12(10), **1939.** 22 p. 8 figs., 7 tables. **DLC**—Air may become saturated with water vapor by evaporation, by mixing and by cooling. Evaporation takes place not only when the air is the same temperature or warmer than water surface in which case fog will not form; but also when the water is warmer than the air in which case fog forms in the presence of condensation nuclei when the air exceeds saturation. Both horizontal and vertical mixing may produce saturation but dense fog will not form from horizontal mixing. With vertical mixing, adiabatic cooling may produce condensation but only in the upper portion of the stratum. The lowest level at which condensation occurs is called the mixing condensation level. Saturation may be caused by adiabatic cooling by up-slope wind (usually producing a deep fog, the "Cheyenne type") and by pressure change, a relatively insignificant factor. Many fogs are caused by cooling due to radiation from the surface and by advection over a colder surface. Some air movement is necessary to the formation of fog but strong winds tend to dissipate fog except in the case of up-slope fog. At low temperatures due to the smaller amount of vapor present, the temperature must fall relatively more than at higher temperatures to produce the same degree of fog. Water fogs seldom form over snow cover due to condensation or sublimation on the snow. Ice fogs do not dissipate so rapidly over snow. The author's fog classification is a categorical expression of these ideas. *Subject Headings:* **1. Fog formation 2. Fog dissipation 3. Fog classification.**

1940

3F–53 551.509.3:551.57

George, Joseph Johnson, **Fog: its causes and forecasting with special reference to eastern and southern United States.** *American Meteorological Society, Bulletin*, 21:135–148, 261–269, 285–291, **1940.** 15 figs., 5 tables. **MH-BH**—A fog classification useful to the forecaster is presented. By using air trajectories, the author suggests how quantitative estimates can be made of some of the factors of the more important types of fog. Using the method outlined here, the author made example studies at Atlanta, Ga., Jacksonville, Fla., Louisville, Ky., San Antonio, Texas, and New Orleans, La. *Subject Headings:* **1. Fog forecasting 2. Fog classification 3. Objective forecasting 4. Southern United States.**

3F–54 551.576:551.509.

Hutchison, H. E. and Fink, K. C., **On the structure of marine air over the San Fernando Valley in relation to forecasting summertime stratus.** *Monthly Weather Review*, 68:11–16, Jan. **1940.** 5 figs., table. **DWB**—A description of the modification of marine air over the San Fernando Valley, the dissipation of stratus in the morning, heating from below and the sea breeze formation of stratus

at night. Difficulties of forecasting stratus and fog for the Valley are mentioned with comment on methods of forecasting proposed here and those used elsewhere. *Subject Headings:* **1. Stratus cloud forecasting 2. Maritime air masses 3. San Fernando Valley, California.**

3F–55 551.575:551.576:551.509.5

Lester, Raymond T., **Forecasting the dissipation of fog and stratus clouds in the San Francisco Bay region.** Thesis (*M.S.*)—California Institute of Technology, May **1940.** 32 p. map, 16 figs. **DWB**—Develops a method of forecasting the dissipation of fog and stratus at Oakland using adiabatic chart data, wind direction and force, and heat received. Method said to be general. *Subject Headings:* **1. Stratus cloud dissolution 2. Fog forecasting 3. San Francisco Bay, California.**

3F–56 551.524.4 551.571.4

Taljaard, J. J. and Schumann, T. E. W., **Upper air temperature and humidities at Walvis Bay, Southwest Africa.** *American Meteorological Society, Bulletin*, 21:293–296, **1940.** fig., table. **MH-BH**—From observations made in October 1939, it is shown that Walvis Bay, similar to southern California, has a moist cool lower layer of air and above this is dry warm air. Stratus is common. *Subject Headings:* **1. Temperature inversions 2. Humidity inversions 3. Walvis Bay, Southwest Africa.**

3F–57 551.5:629.13 551.575/6

†Taylor, George F., **Fog and stratus clouds.** (In his: **Aeronautical meteorology.** New York, Pitman, **1940.** p. 269–302. figs., 16 refs.) **DWB**—An elementary discussion of fog and stratus cloud from the pilot's viewpoint. There is an annotated bibliography which lists the more important works on the subject. *Subject Headings:* **1. Fog 2. Stratus clouds 3. Aeronautical meteorology.**

1941

3F–58 551.521.61:551.524.4

Ashburn, Edward V., **The vertical transfer of radiation through the atmosphere.** *American Meteorological Society, Bulletin*, 22:240–242, **1941.** fig., table, 2 equations. **DWB**—The author states that long wave radiation does not produce an inversion and that cooling of the top of a moist layer of air is not great enough to cause instability in the moist layer. *Subject Headings:* **1. Temperature inversion 2. Infrared radiation.**

3F–59 551.575:551.509.5

Bowdoin, J. W., **The causes and forecasting of low ceiling and fog at Houston, Texas.** *American Meteorological Society, Bulletin*, 22:351–360, Nov. **1941.** 5 figs. **DWB**—Considers winter and spring fogs and low ceilings and relates incidence to type of air mass, wind direction and speed, temperature and dew point depression. Graphs for aid in forecasting are given. *Subject Headings:* **1. Fog forecasting 2. Stratus cloud forecasting 3. Houston, Texas.**

3F–60 551.575:551.509.5

De Hart, John Randle, **Fog study of Miami, Florida.** *Journal of the Aeronautical Sciences*, New York, 8(9):358–360, July **1941.** 10 figs. (5 synoptic maps). **DWB.** Summary in: *American Meteorological Society, Bulletin*, 22:318, **1941.** **MH-BH**—Since moist air can reach Miami from any direction, advection is important to consider in fog forecasting. Tabulations show that the fewest fogs occur with gradient winds from northeast to east, and most fogs with gradient winds from east to southwest; that most fogs occur in March and Jan., the fewest in the summer months; that most fogs occur in tropical maritime air (43%), next most in modified polar continental (39%), and 18% in modified polar Pacific air. Forecasting diagrams are presented which assume moisture gradient, wind and air trajectory remain favorable to time of fog formation. Conditions are favorable for fog formation if the 1930E map shows the dew point depression between 5° and 11°F and gradient winds between 10 and 20 m.p.h. up to 0730E. *Subject Headings:* **1. Fog forecasting 2. Fog frequencies 3. Miami, Florida.**

3F–61 551.509.3:551.575

George, Joseph Johnson, **On the technique of forecasting low ceilings and fogs.** Atlanta, Ga., Eastern Airlines, Inc., Meteorological Dept., Jan. 31, **1941.** 13 p. 6 figs., 2 tables. Mimeographed. **DWB**—Notes on the general concepts of fog classification, occurrence and forecasting based on synoptic charts and nomograms (the latter for determining time of formation based on experience at a given place). Fog formation for 20 places in the eastern U.S. was studied and charts presented to show type of fog and season of occurrence. An analysis of the causes of forecast errors shows

that 70% of such errors could be avoided by careful study of cause of error. (*Same abstract* as No. 2.5-37 in May 1951 *Meteorological Abstracts.*) *Subject Headings:* **1. Fog forecasting 2. Objective forecasting 3. Forecast verification. I. Eastern Airlines, Inc. Meteorological Dept.**—*M.R.*

3F–62 551.524.4:551.576:551.465

Jackson, S. P., **A note on the climate of Walvis Bay.** *South African Geographical Journal*, 23:46–53, April **1941. DLC**—With the limited data available, the conclusion is reached that stratus form in the cool, moist lower layer of air, given sufficient turbulence. The main cause of this extensive inversion appears to be subsidence of the air in these latitudes, but it is no doubt intensified by the cold Benguela Current. This article also discusses precipitation and temperature at Walvis Bay. As the S–SW sea breeze increases in strength, the maximum temperature is higher. This is attributed to mixing with the dry, warm air aloft. *Subject Headings:* **1. Stratus clouds 2. Temperature inversions 3. Cold currents 4. Benguela Current 5. Walvis Bay, Southwest Africa.**

3F–63 551.575

Petterssen, Sverre, **Recent fog investigations.** *Journal of the Aeronautical Sciences*, New York, 8:91–102, **1941. DLC**—A general discussion of the factors affecting fog brought up to date. An address. *Subject Heading:* **1. Fog.**

3F–64 551.576.1

Stone, Newton C., **Helionephograph for determining the breaking time of stratus and fog.** *American Meteorological Society, Bulletin*, 22:291–202, Sept. **1941. MH-BH**—A preliminary report which shows how an estimate of the time of breaking of "California fog" can be made by measuring light received at surface. Describes method but does not give quantitative results. *Subject Headings:* **1. Fog dissipation 2. California stratus 3. Radiation.**

3F–65 551.526.8 551.465

Sverdrup, Harald Ulrik and Fleming, R. H., **The water of the coast of Southern California, March to July, 1937.** *California, University, Scripps Institution of Oceanography, Bulletin*, 14(12): 261–378, **1941. DWB**—An oceanographic survey of the Pacific just off S. California. The surface water temperatures taken on three cruises March 25–April 3, May 5 to May 13 and June 22 to July 2 show the same general pattern. There is an area of upwelling cold water north of Point Conception, the cold water extending southeastward somewhat beyond the latitude of San Diego. In the first cruise this tongue of cold water was between 11°C and 13°C, on the second cruise between 11° and 14°C and on the third cruise between 11° and 15°C. The water was warmer between San Diego and this tongue of cold water—in the first cruise above 14°C, in the second above 16°C and in the third above 20°C. Conditions encountered were considered characteristic. *Subject Headings:* **1. Sea surface temperatures 2. Upwelling 3. Southern California.**

3F–66 551.575.1 551.521.1

Wexler, Raymond, **The dissipation of radiation fog.** *American Meteorological Society, Bulletin*, 22:288, Sept. **1941. MH-BH**—The author suggests a method of determining the time of dissipation of fog at an inland station by computing the total solar radiation. "The amount of heat absorbed beneath the fogs, as indicated by the actual surface temperature and upper air soundings was then determined, and the percentages of the total incident radiation computed. These percentages then determine the time of dissipation to be expected." *Subject Headings:* **1. Fog dissipation 2. Radiation.**

3F–67 551.575.1:629.13

*Woodward, Wendell H., **Fog and stratus at Seattle.** *American Meteorological Society, Bulletin*, 22(6):242–249, June **1941.** 11 figs., table. **MH-BH**—Low ceilings and low visibility are common autumn and winter phenomena at Seattle. Of 273 cases of fog between 1936 and 1939, 223 were radiation fogs. In plotting depression of the dew point an hour before sunset against time of formation of fog, a simple relation between the two was complicated by the variation of such factors as steepness of the lapse rate, gradient wind, height of lower inversion, presence of inversion at intermediate cloud level, time of clearing of sky, and time of wind shift. Factors affecting the time of clearing of fog are an increase in either north of south winds, lifting of fog by insolation, formation of overcast at intermediate level, approach of front, a pressure change which dissipates the low inversion. Maritime low stratus and fog is formed in polar maritime air brought over the airport usually from the south. *Subject Headings:* **1. Fog 2. Stratus clouds 3. Aviation climatology 4. Seattle, Washington.**

1942

3F–68 551.575.1 551.574:551.511

Petterssen, Sverre. **Condensation caused by mixing.** *Royal Meteorological Society, Quarterly Journal*, 68:167–176, **1942.** 2 figs., table, 5 refs. **DWB**—The amount of condensation caused by mixing under various atmospheric conditions is evaluated: 1) mixing of two parcels of air of widely different temperature may lead to saturation or supersaturation (Bezold effect), 2) horizontal mixing with result directly computed from Bezold effect and 3) vertical mixing with the added adiabatic effect gives lower relative humidity in the lower layers and higher relative humidity aloft. Condensation in 3) depends on (a) the mean specific humidity of the air column, (b) distribution of temperature along the vertical and (c) thickness of the mixing layer. Means of computing condensation level and amount of condensed water are given. *Subject Headings:* **1. Fog formation 2. Condensation 3. Mixing ratio.**

1943

3F–69 551.576.31 551.524.4:551.555.1

Barasoain Oderiz, José Antonio. **El mar de nubes en Tenerife.** [Stratus clouds at Tenerife.] *Spain, Servicio Meteorológico Nacional, Publicación, Ser. A*, No. 13, **1943.** 21 p. 10 figs., table. **DWB**—A study of stratus clouds (el mar de nubes) formed under the inversion of the trades as observed from Izaña, Santa Cruz de Teneriffe and Laguna during the year Nov. 1938–Oct. 1939. In the illustrative example used, adiabatic diagrams are made from data at the three stations showing Santa Cruz de Teneriffe and Laguna below the condensation level and Izaña above the inversion. The inversion and clouds occur in all seasons but are most frequent in summer. (*Same item* as No. 3A–299 in Jan. 1952 *Meteorological Abstracts.*) *Subject Headings:* **1. Stratus cloud forecasting 2. Stratocumulus decks 3. Cloud height 4. Trade inversion 5. Teneriffe, Canary Islands. I. Spain. Servicio Meteorológico Nacional.**

3F–70 551.575:551.521

Hewson, E. Wendell. **The reflection, absorption, and transmission of solar radiation by fog and cloud.** *Royal Meteorological Society, Quarterly Journal*, 69:47, **1943.** 8 figs., 2 tables, 16 refs., 10 equations. **DWB**—Equations are given for reflection, absorption and transmission of radiation from sun and sky by fog (drop size 2×10^{-3} cm) and cloud (drop size 5×10^{-4} cm) and values computed for various densities and vertical thicknesses. *Subject Headings:* **1. Radiation 2. Fog effects**

3F–71 551.575/6:629.13(02)

Humphreys, William J., **Fogs, clouds and aviation.** Baltimore, Williams and Wilkins, **1943.** 200 p. 93 figs. Reprinted in 1944. **DLC**—An elementary discussion of fog and cloud forms. Many excellent illustrations on California fog. *Subject Headings:* **1. California stratus 2. Fog 3. Aeronautical meteorology.**

1944

3F–72 551.575 551.576

Bailey, C. E., **Studies in local forecasting, Corpus Christi, Texas.** *U. S. Air Weather Service, Report* No. 600–8, **1944.** 11 p. 6 figs., table. **DWB**—Fog and low stratus at Corpus Christi are formed mostly in air from the Gulf that has had a trajectory over water for 24 hours or more. *Subject Headings:* **1. Fog 2. Stratus clouds 3. Corpus Christi, Texas.**

3F–73 551.575

Byers, Horace Robert, **Fog.** (In his: **General meteorology.** 2nd ed. New York, McGraw-Hill, **1944.** p. 508–545. 24 figs., 4 tables, 15 refs.) **DWB**—Using a modification of WILLETT's classification, the author describes each type and region of occurrence, causes of formation, prevalence and similar characteristics. Using STONE's general regional divisions, characteristics of regimes in the United States are given. There is a short description of other foggy places in the world. Under forecasting fog he explains G. I. TAYLOR's dry bulb—dew point depression diagram and air trajectories. GEORGE's refinements and local evaluations of these ideas, as well as other aids. To forecast dissipation he mentions PETTERSSEN's list of factors (*see item* 3F–39 above) and KRICK's (*see item* 3F–45 above) and WOOD's (*see item* 3F–46 above) techniques. *Subject Headings:* **1. Fog 2. Fog classification 3. United States.**

3F–74 551.575/6

Crowley, Donald M., **An analysis of fog and stratus clouds at Amarillo, Texas.** *Journal of Aeronautical Meteorology*, 1(4):157–172, **1944–1945.** 12 figs., 4 tables, 5 refs. **DWB**—The importance of upslope cooling as a factor in fog-stratus formation at Amarillo, Texas, is emphasized by pointing out that a 30 mi/hr southeast wind cools $2\frac{1}{2}$°F per hour; similarly, a 30 mi/hr northwest wind warms adiabatically $1\frac{3}{4}$°F per hour making fog improbable with wind from this direction unless

radiational cooling is greater than adiabatic warming. Fogs are classified by causative factors as: radiation, radiation-upslope, radiation-upslope-advective, frontal and frontal-upslope. Half of the cases classified were frontal-upslope, one third radiation-upslope-advective. Frontal upslope was accompanied by the highest average wind speed (11.6 mi/hr), and was the longest in average duration (18 hours). *Subject Headings:* **1. Fog 2. Stratus clouds 3. Fog classification 4. Amarillo, Texas.**

3F–75 551.576:551.509.5

Decker, F. W., **Forecasting the formation of stratus in the Livermore Valley.** *American Meteorological Society, Bulletin*, 25:54–57, **1944.** 2 figs., 6 refs. **MH-BH**—Empirical rules for anticipating stratus in the Livermore Valley are developed in the absence of local upper air sounding. These rules take into consideration the influx of cool, moist air from the ocean and the height of the inversion. *Subject Headings:* **1. Stratus cloud forecasting 2. Livermore Valley, California.**

3F–76 551.575:551.465

Great Britain. Meteorological Office, **Weather in home waters and the north-eastern Atlantic. v. 2. Pt. I. The Atlantic from the Azores to the African coast.** 2nd ed. London, H. M. Stationery Office, **1944.** 263 p. 51 figs., 16 tables, 172 refs. M.O. 446b(1). **DWB**—Frequency of poor visibility along the northwest African coast is discussed but data are so combined as to make causes obscure. The summer maximum of fogs is attributed to the cold Canary Current. Low visibility and wind direction are correlated. Stratus cloud is given no particular mention. The text is supplemented by charts and tables. *Subject Headings:* **1. Fog 2. Visibility 3. Cold currents 4. Canary Current 5. Northwest Africa.**

3F–77 551.576:551.509.5

Kaster, H. B., **Forecasting California stratus.** *United Air Lines, Meteorological Research Dept., Meteorology Circular* No. 27, **1944.** 8 p. fig. Mimeographed. **DWB**—For stratus to form in the San Francisco-Oakland area there must be turbulence within and radiation from the top of a moist layer of air which tends to move inland from the ocean. The condensation level must be within this layer. Subsidence within the North Pacific High helps to form an inversion over the layer. Using the relation developed by E. M. VERNON (*see item* No. 3F–41 above) that the condensation level is about 200 ft high for each degree (F) spread in the dry bulb dew point temperatures, the time of formation and dissipation, and the height of the ceiling can be forecast knowing the height of the base of the inversion and the diurnal variation of the dry bulb. *Subject Headings:* **1. Stratus cloud forecasting 2. California stratus 3. California.**

3F–78 551.576.36 551.591

†*U. S. Air Weather Service, **Incidence of low ceilings and low visibilities in the U. S. Pacific coastal regions.** *U. S. Air Weather Service, Report* No. 720, Nov. **1944.** 115+p. 36 figs., 18 tables, 34 refs. **DWB**—A comprehensive tabulation of the data available at the time of preparation. Duration of low ceilings and low visibilities are given as well as frequencies. *Subject Headings:* **1. Fog frequencies 2. Ceiling height 3 Pacific Coast. I. Lamoureux, Clarence Eugene.**

3F–79 551.576.11

Neiburger, Morris, **Temperature changes during formation and dissipation of west coast stratus.** *Journal of Meteorology*, 1(1/2):29–41, Sept. **1944.** 5 figs., 4 tables, 13 refs. Also: *U. S. Weather Bureau, Research Paper* No. 19, **1944.** **MH-BH**—Radiosondes at 3-hour intervals July 5–6, 15–17 and Sept. 27–29, 1943 gave temperature-time sections through St. to above 4 km at Los Angeles. Base and top of inversion both show marked diurnal variation of height and temperature; base is highest about 8 h and lowest in evening. Ceiling (inversion base) at inland stations is compared. Formation of St. was not entirely due to advection and not to radiation or turbulence, adiabatic cooling due to vertical motion was the main factor. The vertical motion may be due to convergence of land and sea breeze. *Subject Headings:* **1. Fog 2. California stratus 3. California.**—*C.E.P.B.*

3F–80 551.582(68) 551.576

*South Africa. Meteorological Services, **Weather on the coasts of South Africa; the west coast.** [n.d.] 23 p. 8 figs., tables. Mimeographed. **DWB**—An analytical study of climatic and aerological data for the coasts of Angola and southwest Africa. The discussion and tables of frequency of winds, visibility, and coastal fog are especially valuable. The coastal radiation and advection fog and stratus clouds, similar to those which occur on the Californian coast, are described in detail for the various sectors. Rainfall and temperature conditions on the coast and flying conditions over the sea are also treated. *Subject Headings:* **1. Weather 2. Coastal fog 3. Southwest African Coast.**—*M.R.*

3F–81 551.582(688)

†*South Africa. Meteorological Services, **Weather on the coasts of Southern Africa. v. II. Local information. Pt. I. From River Congo to Cape Delgado. 1944.** 61 p. 12 figs., numerous

tables, 26 refs. **DWB**—A careful description of the climate of the desert coast of southwest Africa with supporting tables of data. Fog and stratus are described but no explanation is offered. *Subject Headings:* **1. Weather 2. Fog data 3. South African Coast.**

3F–82 551.576:551.509.34

U. S. Air Weather Service, **Studies in local forecasting. Salinas AAB, California.** *U. S. Air Weather Service, Report* No. 600–70, Sept. **1944.** 24 p. 16 figs., 7 tables. **DWB**—The first part deals with the relation of frontal passage at the surface to troughs at the 10,000 ft level. The second part deals with stratus dissipation and is based on data for April, May and June 1944. The principal factors affecting the dissipation are height of the top of the stratus, thickness of the cloud layer, change in inversion height, direction and force of the wind and the presence of a higher cloud layer. With stratus having ceilings 1200 ft or lower, the height of the top appeared to be the most important single factor, but with higher stratus the thickness of the condensation layer appeared to be more important. Charts showing these relationships were constructed. Where data on the top of the layer were not available, helionephograph data were valuable. Tables of climatic data including flying weather are given. *Subject Headings:* **1. Stratus cloud forecasting 2. Local forecast studies 3. California stratus 4. Stratus cloud dissolution 5. Salinas, California.**

3F–83 551.575/6:551.509.34

U. S. Air Weather Service, **Studies on local forecasting, San Francisco, California.** *U. S. Air Weather Service, Report* No. 600–18, Sept. **1944.** 14 p. 2 tables, 11 figs. **DWB**—To forecast the dissipation of fog and low stratus the heat necessary for dissipation was computed from the upper air sounding and a correction for wind made as suggested in LESTER's study (*see item* No. 3F–55). A few observations in June 1944 with a helionephoscope indicated better results might be obtained with this instrument. Formation of fog or low stratus is forecast if there is a sharp inversion, an onshore pressure gradient, and a potential temperature of 287°A or lower. *Subject Headings:* **1. Fog forecasting 2. Local forecast studies 3. California stratus 4. San Francisco, California.**

3F–84 551.575/6:551.509.34

U. S. Air Weather Service, **Studies on local forecasting, Long Beach Army Air Field, Long Beach, California.** *U. S. Air Weather Service, Report* No. 600–128, Oct. **1944.** 15 p. 4 figs., 3 tables. **DWB**—In forecasting the formation of fog and stratus at Long Beach one should know the normal stratus cycle. There should be an onshore pressure gradient with isobars parallel to the coast; an inversion is necessary and should be below 3000 to 3500 ft. The maximum temperature at inland stations is related to the height of the top of the stratus: the higher the maximum at Newhall, the lower the top of the stratus the next day at Long Beach. Haze and the temperature-dew point spread need to be considered. To forecast the dissipation of stratus all the formation factors must be weighed and in addition the thickness of the stratus layer and the amount of radiation reaching the earth's surface. The helionephoscope has proven very helpful. A climatic table for Long Beach is given. *Subject Headings:* **1. Fog forecasting 2. Local forecast studies 3. California stratus 4. Long Beach, California.**

3F–85 551.576:551.509.34:629.13

U. S. Air Weather Service, **Studies in local forecasting, Hamilton Field, California.** *U. S. Air Weather Service, Report* No. 600–119, Oct. **1944.** 19 p. 6 tables. **DWB**—Summer stratus can reach this field either by topping the hills to the west or by coming from the south up San Francisco Bay. Summer fog is usually brought by wind from the south. Since this is against the usual summer pressure gradient, the field is more favorably located in this respect than many in the area. Fogs and stratus of this type become important in late May, increase to a maximum in July, August and September, but are infrequent again after the first half of October. Tables give climatic data including flying weather. *Subject Headings:* **1. Local forecast studies 2. California stratus 3. Flying weather 4. Hamilton Field, California.**

1945

3F–86 551.576:551.521.1

Haurwitz, Bernhard, **Insolation in relation to cloudiness and cloud density.** *Journal of Meteorology*, 2(3):154–166, **1945.** 10 figs., 7 tables, 7 refs. **DWB**—Measurement in calories of the total insolation through clouds of different densities and for different solar heights. *Subject Heading:* **1. Radiation.**

3F–87 551.576

Lamoureux, Clarence Eugene, **Regional and seasonal distribution of low ceiling along the U. S. Pacific coast.** *American Meteorological Society, Bulletin*, 26:278–283, Sept. **1945.** 5 figs. **MH-BH**—Low ceilings are divided into four groups by seasonal incidence and the geographical distribution of each group described. *Subject Headings:* **1. Ceiling height 2. Pacific Coast.**

3F–88 551.553.11:551.576.11:551.509.3

*Neiburger, Morris, Beer, Charles G. P. and Leopold, Luna B., **Report on the 1944 investigation of California stratus.** 2 v. California, University, Dept. of Meteorology, Jan. **1945.** v. 1. 62 p. 35 figs., 9 tables, 9 refs. v. 2 entirely radiosonde data. Typescript. **DWB**—Stratus forms at the base of a strong inversion, usually at relative humidities of about 90% over Los Angeles. The lapse rate below the inversion varies from slightly sub-adiabatic at night to super-adiabatic in the afternoon. The base of the stratus is closely related to the surface dew point except for the higher ceilings, and is lowest at night. In general, the inversion slopes upward from the coast both toward land and sea. It is highest over land in the afternoon and lowest at night while over the sea it is highest at night and lowest during the day. The mixing ratio decreases slightly up to the inversion base where it drops abruptly, but occasionally it may rise near the top of the inversion. The height of the inversion is related to the coast-inland pressure gradient. *Subject Headings:* **1. California stratus 2. Temperature inversions 3. Humidity inversions 4. Southern California. I. California. University. Dept. of Meteorology.**

3F–89 551.576:551.509.53

Smalley, Clarence L., **Forecasting the stratus clouds at San Francisco airport.** *U. S. Weather Bureau, Research Report,* March **1945.** 19 p. 6 figs. Typescript. **DWB**—The author describes the location of the airport relative to its access by marine air currents. Cool, moist marine air moving inland is warmed and becomes unstable, the resulting turbulence probably contributes to the formation of an inversion. Cooling at night must reduce the air temperature to the saturation point at or below the base of the inversion for stratus to form. If the pressure gradient causing the advection is weak, only surface air will be moved while with a stronger gradient a layer 2500 to 3000 ft may be moved. If the hilltops are above the condensation level, the ceiling will be higher to leeward than to windward of the hills. The synoptic situation of June 27, 1941 is the basis for a discussion of eddy winds pattern. "With a well developed wind eddy trough on the California coast, the trough line will mark the northern limit of coastal stratus clouds." Radiation is considered constant unless high clouds are present. The principal forecast scheme is based on two factors: 1) the difference in pressure between Eureka and San Francisco which is taken as an indication of the wind direction and 2) the difference in pressure between San Francisco and the average of Redding and Fresno which is taken as a measure of the force of the resulting wind. Stratus do not form if San Francisco is 5 to 6 mb below Eureka. Ceiling height is also indicated by combinations of these two factors, the limits of which are given. The time of formation of stratus is estimated from the temperature and depression of the dew point at the 4:30 p.m. observation and the maximum temperature which indicated the height of the inversion. Appended are eight rules covering specific situations such as "With ceilings less than 500 ft at sunrise there will ALWAYS be improvement to at least the next classification after 9:00 a.m. and about 85% of the time after 8:00 a.m." *Subject Headings:* **1. Stratus cloud forecasting 2. California stratus 3. Ceiling height 4. San Francisco, California.**

3F–90 551.509.59:551.576:629.13

Steffan, H. C. and Morgan, J. H., **Forecasting stratus ceilings at San Francisco Airport.** San Bruno, Calif., U. S. Weather Bureau Airport Station, **1945.** 45 p. charts, maps, tables, ref. Manuscript. **DWB**—A series of smoothed curves representing average hourly temperatures with winds from all directions (summers, 1940–44) is included. Selected synoptic maps illustrate the stratus or non-stratus conditions associated with varying mean pressure patterns and 2000 ft resultant winds. The importance of insolation for stratus dissolution is shown graphically. For preparation of estimates of time of occurrence of stratus ceilings, daily check sheets were kept on pressure distribution and the "Roab dewpoint depression." (*Same abstract* as No. 3E–62 in May 1952 *Meteorological Abstracts.*) *Subject Headings:* **1. Objective forecasting 2. Stratus cloud forecasting 3. Airways forecasting 4. San Francisco, California.**—*M.P.K.*

3F–91 551.576:551.509.5

Stocker, G. H., **Forecasting Bay region stratus.** *Journal of Aeronautical Meteorology,* 1(4):129–139, **1944–1945.** 13 figs. **DWB**—With the necessary conditions in the San Francisco Bay region that winds must have an onshore component and that the base of the inversion must lie above the condensation level of the air below it, rules are drawn up as an aid in forecasting stratus. (*Same item* as No. 3E–63 in May 1952 *Meteorological Abstracts.*) *Subject Headings:* **1. Stratus cloud forecasting 2. California stratus 3. San Francisco Bay.**

3F–92 551.509.5:551.576

Vernon, Edward M., **Forecasting the time of formation of stratus cloud ceiling at Oakland, California airport.** *U. S. Weather Bureau, Research Paper* No. 23, April **1945.** 9 p. fig., 3 tables. **DWB**—As an aid to new forecasters until they become better acquainted with the behavior of stratus.

a regression equation is developed based on observations taken 1934–1940 to determine the time of the formation of stratus ceilings below 2000 ft at Oakland airport. Elements used are pressure gradient 1/2((Eureka+Fresno) Oakland), temperature (Oakland–Mt. Hamilton), and the depression of the dew point at Oakland. The formula was tested in 1942 but was not considered entirely satisfactory. Six additional auxiliary rules covering special cases are given. *Subject Headings:* **1. Stratus cloud forecasting 2. California stratus 3. Oakland, California.**

3F–93 551.521.1:551.575

Wexler, Raymond, **On the radiation cooling of a layer of fog.** *American Meteorological Society, Bulletin*, 26:217–219, **1945.** 2 figs., 11 equations. **DWB**—A theoretical discussion of night cooling by radiation of a fog or cloud layer 50 m or more in thickness. *Subject Heading:* **1. Radiational cooling.**

1946

3F–94 551.576:551.46

Alpert, Leo, **Atmospheric cross-section of the stratus zone of the tropical eastern Pacific ocean.** *American Geophysical Union, Transactions*, 27(6):800–813, **1946.** 12 figs., 3 tables, 13 refs. **DWB**—Westward from Ecuador to the Galapagos and beyond is an area of upwelling cool water in the Pacific. This cool surface and the subsidence from the South Pacific High during the Northern Hemisphere summer favor the formation of temperature and humidity inversions and the formation of stratiform clouds over ocean areas. Details of airplane reconnaissance flight observations, surface, balloon and radiosonde observations for Aug. 14–18, 1945 are given. *Subject Headings:* **1. Stratus clouds 2. Upwelling 3. Tropical Pacific.**

3F–95 551.582(86) 551.576:551.46

Alpert, Leo, **Note on the weather and climate of Seymore Island, Galapagos Archipelago.** *American Meteorological Society, Bulletin*, 27(5):200–209, May **1946.** 3 figs., 3 tables. **DWB**—Cold water upwells around Seymore Island which cools the surface air for nine months of the year. There is an inversion above the cool air but the subsiding air from the South Pacific High is not thought to be the principal factor in its formation. The stratus formed in this cool layer of air generally gives ceilings of 2000 to 2500 ft and has its top at 3000 to 4000 ft. The island is practically desert below and above the stratus, but the elevations within the stratus layer have lush vegetation. There is a climatic table giving about 2-year averages. *Subject Headings:* **1. Climatology 2. Stratus clouds 3. Upwelling 4. Seymore Island, Galapagos Archipelago.**

3F–96 551.576:551.509.51

Blake, Dean, **Subsidence and the west coast inversion.** *U. S. Weather Bureau, Research Report*, [**1946?**] 9 p. diagr. **DWB**—After correlating upper air pressures at Phoenix and Santa Maria to show that they vary together, after correlating maximum temperatures with base of stratus at Elsinore, Indio and Mt. Wilson, and showing that upper air pressure variation is in phase with surface temperature variation, the conclusion is reached that the extent and depth of marine air is the result of subsiding air, and that the relative height of the inversion would be indicated from the prediction of changes in the upper air pressure. Local variations complicate the problem of forecasting the time of formation and dissipation of stratus. *Subject Headings:* **1. Stratus cloud forecasting 2. California stratus 3. Subsidence inversions 4. Southern California.**

3F–97 551.576.4:551.574

Bundgaard, R. C., **Comparison of lower cloud bases with condensation levels.** *American Meteorological Society, Bulletin*, 27:1–5, **1946.** 2 figs., table. **MH-BH**—The author compared observed cloud base heights with the lifting condensation level (LCL), using only surface data, and the convective condensation level (CCL), which uses upper air temperature and surface moisture data. LCL corresponds closely with the base of lower clouds in a great many cases involving all cloud forms; whereas the CCL is valid only for stratocumulus and cumulus. Most cloud bases are below CCL and above LCL. *Subject Headings:* **1. Cloud height 2. Condensation level.**

3F–98 551.551:533.15

Frost, R., **Turbulence and diffusion in the lower atmosphere.** *Royal Society of London, Proceedings, Ser. A*, 186:20–35, **1946.** equations. **DWB**—The author says that a semi-empirical expression is obtained for the virtual coefficient of diffusion and, with the aid of this expression, solutions of the equations of eddy diffusion and the equations of motion with given boundary conditions are obtained which are self-consistent and which are in good agreement with observations. Examples used are water vapor over land and sea and smoke diffusion near the ground. *Subject Heading:* **1. Turbulent diffusion.**

3F–99 551.576:551.509.5

Steffan, H. C. and Morgan, J. H., **Stratus ceilings at San Francisco airport during summer season.** *Journal of Aeronautical Meteorology*, 2(4/5):105–113, **1946.** 5 figs., 10 refs. **DWB**—A description of stratus formation and movement in the neighborhood of the San Francisco airport and forecasting rules of thumb that should be helpful. *Subject Headings:* **1. California stratus 2. Stratus cloud forecasting 3. Ceiling height 4. Rules of thumb 5. San Francisco, California.**

1947

3F–100 551.509.5:551.575 551.509.5:551.576

Leipper, Dale F., **California fog forecasting correlations, 1935 and other years.** California, University, Scripps Institution of Oceanography, Contract N6ori-211, Fog Project Report No. 2, **1947.** 7 p. fig., 4 tables. **DWB.** Also in: *American Meteorological Society, Bulletin*, 29(6):294–297, **1948. MH-BH**—This is a report on an evaluation, based on observations, of S. PETTERSSEN's ideas as expressed in "On the causes and forecasting of the California fog" (*see item* No. 3F–39 above). The author concludes that the investigations "serve to strengthen some of the arguments presented by PETTERSSEN and to weaken others. They indicate that the problem of fog forecasting is not a simple one, but is one which requires further intensive investigation." *Subject Headings:* **1. Fog forecasting 2. Stratus cloud forecasting 3. Correlations 4. California stratus. I. California. University. Scripps Institution of Oceanography II. Contract N6ori-211.**

3F–101 551.576:551.509

Leipper, Dale F., **Sea surface temperature variations influencing fog formation in southern California.** *California, University, Scripps Institution of Oceanography, Oceanographic Report* No. 9, Sept. 11, **1947.** 24 p. 11 figs., 2 tables. **DLC**—While, in general, the same sea surface temperature patterns appear each year there are differences due to oceanographic, meteorological and radiational factors. At La Jolla, the average sea surface temperature in Aug. 1931 was 23.3°C, in Aug. 1932, 18.7°C. Variations are large enough that they should be observed and taken into account in fog forecasting. *Subject Headings:* **1. Sea surface temperatures 2. Fog forecasting 3. La Jolla, California.**

3F–102 551.575:016

†Leipper, Dale F., **Fog bibliography.** California, University, Scripps Institution of Oceanography, Contract N6ori-211, Fog Project Report No. 1, **1947.** 14 p. Mimeographed. **DWB**—A bibliography of the more significant articles on fog and related phases of temperature and stratus cloud. There is a definite "west coast of U. S." bias in the selection. Four pages are French and German references. *Subject Headings:* **1. Fog 2. California stratus 3. Bibliographies. I. California. University. Scripps Institution of Oceanography II. Contract N6ori-211.**

1948

3F–103 551.524.4

Blake, Dean, **The subsidence inversion and forecasting maximum temperature in the San Diego area.** *American Meteorological Society, Bulletin*, 29(6):288–293, **1948.** 2 figs., table. **MH-BH**—The height of the subsidence inversion is shown to be inversely related to the maximum temperature near San Diego and further inland on many days in summer. The ceiling and top of the stratus layer as well as various other parameters were correlated with maximum temperatures. *Subject Headings:* **1. Subsidence inversion 2. Objective forecasting 3. Maximum temperature forecasting 4. San Diego, California.**

3F–104 551.555.1:551.524.4

*Emon, Jean, **L'inversion de l'alizé dans l'océan Indien Sud-Ouest.** [Trade inversion in the southwestern Indian Ocean.] *Madagascar, Service Météorologique, Publication* No. 11, July **1948.** 267 p. tables, graphs, 18 refs. **DWB**—A detailed discussion of radiosonde data taken during 1943–1945 at Diego Suarez, Plaisance-Maurice and Tulear as they relate to the trade inversion. The temperature, humidity and winds within and at the upper and lower boundaries of the inversions are treated in detail. Clouds are not considered but humidity at the base of the inversion indicates the probable presence of stratus in about 10 to 15% of occasions. The most frequent humidity at the inversion base is 80–89% except at Tulear where it is 100%. *Subject Headings:* **1. Trade inversion 2. Stratus clouds 3. Indian Ocean.**

3F–105 551.575/6:551.509.51

Farthing, E. D., **Forecasting low stratus and fog at MKC.** *Trans World Airlines, Inc., Meteorological Bulletin*, No. 48–4, [1950] 6 p. 3 graphs, append. **DWB**—Pressure gradient and orienta-

tion for Kansas City, Mo., was computed from four surrounding stations as a measure of wind direction and force. Plotting against low ceiling and low visibility it was found that about 40% of the gradients between 012° and 191° with strength of 5 mb or less accounted for nearly all ceilings below 400 ft and visibilities less than 1 mile. The 60% failures were mostly accounted for by a change in gradient or strength, or by advection of drier air. Forecasting charts are drawn and found useful in practice. (*Same item* as No. 3E 160 in May 1952 *Meteorological Abstracts.*) *Subject Headings:* **1. Fog forecasting 2. Stratus cloud forecasting 3. Ceiling height 4. Kansas City, Missouri.**

3F–106 551.509.5:551.575

*George, Joseph Johnson, **Further studies in air mass fog at Atlanta. Part I—Advection fog.** [Atlanta, Eastern Airlines, Inc., Meteorological Dept., **1948.**] 8 p. 4 figs., table, 2 refs. Mimeographed. **DWB. Part II—Radiation fog.** *Ibid.* 10 p. 2 figs., 4 tables, ref. Mimeographed. **DWB**—Data for April 1945–Oct. 1948 for all types of air mass fog are tabulated, analyzed and classified, and the results used to furnish additional or more refined objective forecasting rules and tools for Atlanta, than were contained in the author's 1939 paper on fog forecasting at Atlanta. As usual the catalog of cases and the derived scatter diagrams which proved useful are presented. (*Same abstract* as No. 2.3-28 in March 1951 *Meteorological Abstracts.*) *Subject Headings:* **1. Fog forecasting 2. Objective forecasting 3. Radiation fog 4. Atlanta, Georgia. I. Eastern Airlines, Inc. Meteorological Dept.**—*M.R.*

3F–107 551.576.11

George, P. A., **Low stratus clouds over Bangalore.** *India, Meteorological Dept., Scientific Notes*, 10(123):119–132, **1948.** 12 figs., 3 tables. **DWB**—Orographic lifting of moist air by an east or southeast wind, or a southwest or west wind is the principal cause of stratus at Bangalore. Stratus is most frequent in July and August in the monsoon season. There is a smaller maximum in winter. In winter, stratus is frequently associated with anticyclonic weather and an inversion. Determination of moisture content of the air and height of the inversion, if present, are valuable aids in forecasting the formation and dissipation of stratus. *Subject Headings:* **1. Stratus cloud formation 2. Stratus cloud forecasting 3. Bangalore, India.**

3F–108 551.575.1

Leipper, Dale F., **Fog development at San Diego, Calif.** *Journal of Marine Research*, 7(3):337–346, **1948.** 3 figs., 12 refs. **DWB**—A model illustrating the manner in which fog situations develop in the winter period in the San Diego area is presented as consisting of: 1) the presence over the sea of air warmer than the sea surface and relatively dry aloft while the Pacific High moves inland over northern California producing easterly winds aloft at San Diego; 2) weakening of the High so that warm dry air offshore from San Diego stagnates, becoming moist and forming a surface inversion; 3) the normal northwesterly air flow and sea breeze regime returns and fog forms; 4) the surface layer deepens, both onshore and offshore fog join, and with additional deepening the fog persists only as stratus. The complete sequence takes about 5 days but it is subject to interruption at any stage. Three non-diurnal indexes using height of the inversion base, temperature and moisture are developed which are necessary but not sufficient conditions for fog formation at Lindbergh Field on a given day in either summer or winter. *Subject Headings:* **1. Fog formation 2. San Diego, California.**

3F–109 551.575/6:551.509.5

Leipper, Dale F., **Fog forecasting on coasts.** California, University, Scripps Institution of Oceanography, Contract N6ori-211, Fog Project Final Report, **1948.** 133 p. figs., graphs, tables, 27 refs. **DWB**—The principal factors entering into the formation and dissipation of coastal fog are evaluated and a plan of attack on the problem of forecasting coastal fog outlined. The plan of attack is applied to the San Diego area and three indexes for forecasting fog are derived: 1) height of the inversion base, 2) temperature index based on air and water temperature and 3) moisture index based on dew point and water temperature (at Scripps Pier). These indexes are applied not only to fog forecasting but also to visibility and ceiling (stratus base). In general the lower the temperature index $\{(T_{(air)} - T_{(water)}\}$ the higher the ceiling and similarly with the moisture index $\{DP - T_{(water)}\}$ the lower the index the higher the ceiling. *Subject Headings:* **1. Fog forecasting 2. California stratus 3. Ceiling height 4. San Diego, California. I. California. University. Scripps Institution of Oceanography II. Contract N6ori-211.**

3F–110 551.509.318:551.576

Neiburger, Morris, **Stratus project final report for year ending June 30, 1948.** California, University, Dept. of Meteorology, Contract N6onr-275, [**1948.**] 48 p. figs., tables, refs. **DWB**—A description of the project and papers on the transfer of solar radiation through clouds, reflection of diffuse radiation by the sea surface, nuclei and drop size, a captive balloon sonde, and sea surface

temperature anomalies. *Subject Headings:* **1. Stratus Project 2. California stratus. I. California. University. Dept. of Meteorology II. Contract N6onr-275.**

1949

3F–111 551.576

Charl, P., **Les stratus d'Agadir.** [Stratus at Agadir.] *La Météorologie*, 4th Ser., No. 14:107–111, April/June **1949.** 4 figs., 2 refs. French and English summaries p. 107. **DWB**—Charts (based on three years of data) show hourly and monthly frequencies of stratus with ceilings $\leqslant$400 m compared with time of sunrise and frequency of winds $\geqslant$7 m/sec. Diurnal circulation scheme on days with and without stratus discussed and illustrated schematically with respect to airport, hills and sea. Advection stratus (ceilings 30–50 m), although less frequent than radiation stratus, occurs $>$20% of the time in July, sometimes persists for hours and is very dangerous for aviation. (*Same abstract* as No. 3A-278 in Jan. 1952 *Meteorological Abstracts.*) *Subject Headings:* **1. Stratus cloud frequencies 2. Aviation climatology 3. Agadir, Morocco.**—*M.R.*

3F–112 551.509.5:551.576

Corwin, H. G., **Terminal weather at Los Angeles, California.** U. S. Weather Bureau, Dec. **1949.** 26 p. 8 charts, 2 maps, 16 refs. **DWB**—A discussion of weather factors affecting LAX (Los Angeles) including empirical forecast rules for stratus and fog, smoke pollution, precipitation and the Santa Ana. Summer stratus and fog are described with special reference to Los Angeles. For instance, pressure gradients favorable for stratus formation are: SFO (San Francisco)—LAX less than 5 mb, LAX—SIL (Silver Lake) greater than 3 mb and BFL (Bakersfield)—LAX less than 5 mb. For dissipation of stratus an evaluation of both KRICK's and WOOD's methods is given. *Subject Headings:* **1. Stratus cloud forecasting 2. Fog forecasting 3. California stratus 4. Los Angeles, California. I. U. S. Weather Bureau.**

3F–113 551.575/6

El-Fandy, M. G. and Elnesr, M. K., **On conditions favoring low stratus formation over the Middle East in summer.** *American Meteorological Society, Bulletin*, 30:357–359, **1949.** 4 figs., table, 4 refs. **MH-BH**—Fog and low stratus form in summer at Heliopolis under a subsidence inversion in cool, moist air from the Mediterranean. (*Same item* as No. 2J 237 in Oct. 1951 *Meteorological Abstracts.*) *Subject Headings:* **1. Fog 2. Stratus clouds 3. Subsidence inversion 4. Heliopolis, Egypt.**

3F–114 551.582(642) 551.575

Font Tullot, Inocencio, **El clima del Africa occidental Española.** [Climate of Spanish West Africa.] *Spain, Servicio Meteorológico Nacional, Publicación, Ser. A, Memorias*, No. 21, **1949.** 88 p. 27 figs., 4 tables. **DWB**—On pages 22–24 there is a description of the seasonal distribution of coastal fog. There are climatological tables for Sidi-Ifni, Cabo Juby, Villa Cisnero (all 1941–1947) and Smara (1943–1947). (*Same item* as No. 3A–281 in Jan. 1952 *Meteorological Abstracts.*) *Subject Headings:* **1. Climate of Spanish West Africa 2. Fog distribution 3. Stratus clouds 4. Spanish West Africa. I. Spain. Servicio Meteorológico Nacional.**

3F–115 551.509.5:551.576:629.13

Gringorten, Irving I., **A study in objective forecasting.** *American Meteorological Society, Bulletin*, 30:10–15, **1949.** 5 tables, 3 figs. **MH-BH**—Adapting the use of punched cards to the development of objective forecasting procedures, the author takes as an illustrative example the forecasting of fog and low stratus at Randolph Air Force Base, Texas. Some 20 factors and their combinations are used to develop a procedure which in this case proved better than the currently used subjective forecasts. (*Same item* as 3E–132 in May 1952 *Meteorological Abstracts.*) *Subject Headings:* **1. Objective forecasting 2. Fog forecasting 3. Stratus cloud forecasting 4. Punched card methods 5. Randolph Field, Texas.**

3F–116 551.575:551.465

Kendrew, Wilfrid George, **Climatology.** 3rd ed. Oxford, Clarendon Press, **1949.** 383 p. **DWB**—Describes fog along "cold water coasts." Mentions Southwest Africa, Chile and Peru, Morocco and California. Gives brief account of fog at each place. *Subject Headings:* **1. Fog 2. Cold currents 3. Southwest Africa 4. Chile 5. Peru 6. Morocco 7. California.**

3F–117 551.576 551.555.1:551.524.4

Neiburger, Morris and Johnson, David S., **Stratus Project Final Report.** California, University, Dept. of Meteorology, Contract NR 082-019, Oct. 31, **1949.** 34 p. 25 figs. Mimeographed. **DWB**—This report covers activities on this project after June 30, 1948. During the winter the

program was reoriented to emphasize marine aerology. The phases dealing with high level diurnal pressure and temperature studies using data taken on Mount Baldy, South Hawkins and Mt. Wilson; the study of sea surface and temperature anomalies and the study of nuclei and drop size were curtailed and abandoned. Results were meager and inconclusive. Three cruises were made on which upper air obs were taken: 30 June–15 July, 3 Aug.–17 Aug., 3 Sept.–16 Sept. Inversion heights were plotted. Apparently there is a diurnal fluctuation. As mentioned in the previous report the usual inversion pattern is a ridge normal to the coast and an increase in height seaward. *Subject Headings:* **1. Stratus clouds 2. Trade inversion 3. Stratus Project 4. California stratus. I. California. University. Dept. of Meteorology II. Contract NR 082-019.**

3F–118 551.57

Neiburger, Morris and Wurtele, M. G., **On the nature and size of particles in haze, fog, and stratus of the Los Angeles region.** *Chemical Reviews*, Baltimore, 44(2):321–335, April **1949.** 4 figs., 6 tables, 23 refs., 13 equations. **DLC**—Relative humidity in clouds at Los Angeles is often 90%, at rural Santa Maria generally 100%. Cloud droplets in equilibrium at 90% would require the improbable concentrations of 17% NaCl or 23% H_2SO_4, so difference is not due to combustion processes. Most frequent drop radius is 7μ except near base; it is inferred that increased condensation in stable clouds gives more but not larger droplets. Relation between visibility and drop size is discussed and drop size is determined from humidity and visibility. It is found that radius varies from 8μ at 98% R.H. to 3μ at 67.5% and number decreases from 23 to 7 per cc. *Subject Headings:* **1. Haze 2. Fog 3. Stratus clouds 4. Drop size distribution 5. Los Angeles, California.**

3F–119 551.521:551.576

Neiburger, Morris, **Reflection, absorption, and transmission of insolation by stratus cloud.** *Journal of Meteorology*, 6(2):98–104, April **1949.** 7 figs., 9 refs., 16 equations. **MH-BH**—Observations were made below, in and above cloud off California with two Eppley pyrheliometers mounted above and below a blimp, and also of drop size and liquid content of cloud. A theoretical variation of albedo with cloud thickness, drop size, etc. is derived. Observed albedo varied from about 12% with cloud 125 ft thick to 75% with cloud nearly 2000 ft thick. It agreed with computed albedo for thick but not for thin cloud. *Subject Headings:* **1. Albedo 2. Stratus clouds 3. Transmission of light 4. California.**—*C.E.P.B.*

1950

3F–120 551.521.3 551.521.61:551.574.1:551.591.1

Bricard, J., **Propagation of visible and infra-red radiations through fog.** Royal Meteorological Society, Centenary Proceedings, **1950.** p. 36–42. 7 figs., 16 refs., 3 equations. **MH-BH**—A beam of wave length λ passing through N water drops of radius R is diffused in ratio $2N\pi R^2(R/\lambda)$. The function $f(R\ \lambda)$ is plotted against $2\pi R/\lambda$ and shows 2 maxima at 6 and 15. Frequency curves of drop sizes in fog and cloud differ appreciably. Absorption of light of different wave lengths in artificial fog studied experimentally was almost constant in all parts of the spectrum (0.5–5μ) and agreed with that calculated from the theoretical equation of coefficient of apparent absorption. (*Same abstract* as No. 2.3–84 in March 1951 *Meteorological Abstracts.*) *Subject Headings:* **1. Fog 2. Radiation 3. Condensation nuclei 4. Visibility.**—*C.E.P.B.*

3F–121 551.576:551.509.5

§Carson, Robe B., **The Gulf Stream front: a cause of stratus on the lower Atlantic Coast.** *Monthly Weather Review*, 78(6):91–101, June **1950.** 21 figs., 4 refs. **MH-BH**—Several typical wintertime stratus situations along the Atlantic coast from Hatteras to Miami are analyzed in detail and illustrated synoptically (Nov. 19–22, Dec. 12–14 and Dec. 22–23, 1947) by means of soundings. Evidence supports theory that this fog is of frontal origin, emanating from the Gulf Stream. (*Same abstract* as No. 11–36 in Nov. 1950 *Meteorological Abstracts.*) *Subject Headings:* **1. Fog forecasting 2. Gulf Stream front 3. South Atlantic States.**—*M.R.*

3F–122 551.576:551.509.5

Fletcher, Robert D., **Seminar lecture notes on California stratus forecasting.** [n.d.] 14 p. sketch illustrations. Mimeographed. **DWB**—Outline notes and sketches for a thorough discussion of stratus with one section on the current status of stratus forecasting. *Subject Headings:* **1. Stratus cloud forecasting 2. California stratus.**

3F–123 551.576.12:551.509.5

Gifford, Frank, Jr., **Forecasting the height of formation of stratus clouds.** *American Meteorological Society, Bulletin*, 31(2):31–37, Feb. **1950.** 4 figs., table, 14 refs., 3 equations. **DWB**—Eliminating cases of stratus which occur with precipitation or on a change from land to sea breeze, the author compiles and analyzes the data on the relation of wind speed and nocturnal cooling to

height of stratus layer, and presents it in descriptive and graphical form with reference to the "roughness length" parameter. From these scatter diagrams one can see at a glance how often clouds might form before or below the ideal time or height as calculated from theoretical equations. Also some evidence of theoretical possibility of stratus forming at very low levels or on the surface with high winds (as in the Aleutians or at Cheyenne), is adduced. Humidity was not considered in this study. (*Same abstract* as No. 4–104 in April 1950 *Meteorological Abstracts.*) *Subject Headings:* **1. Cloud forecasting 2. Objective forecasting 3. Stratus clouds.**—*M.R.*

3F–124 551.576.12:551.509.59

Handy, Burton, Jr., **Forecasting winter-time stratus at Kansas City, Mo.** *American Meteorological Society, Bulletin*, 31(2):38–43, Feb. **1950.** 3 figs., tables, 6 refs. **DWB**—From a scatter diagram showing cases of stratus (ceiling 1,500 ft or less) and no stratus, with various temperatures and dew points, and another showing occurrences with various wind directions and speeds, a composite chart is compiled showing probability of stratus formation, and the 40% probability isopleth is used as the critical value for forecasting whether or not stratus will form between 0430 and 1230C at Kansas City. Cases falling between 20% and 60% are apt to be difficult to forecast; those above 60% are quite reliable for forecasting stratus; those below 20% almost sure bets for a no-stratus forecast. Method tested for six winter months giving accuracy of 76% and skill score chance of 32%; not as good as subjective Weather Bureau forecasts, but useful as a tool for doubtful cases. (*Same abstract* as No. 4–105 in April 1950 *Meteorological Abstracts.*) *Subject Headings:* **1. Stratus cloud forecasting 2. Objective forecasting 3. Kansas City, Missouri.**—*M.R.*

3F–125 551.575:551.576:551.509.5

Hyler, W. C., **Stratus formation and non-frontal stratus at Lisbon Airport.** *Portugal, Serviço Meteorológico Nacional, Memorias*, No. 8, **1950.** 11 p. 7 figs. **DWB**—Remarks on the problem of fog and stratus. Application is made to Lisbon Airport with suggestions on forecasting. "Southwest" and "north" types are described. *Subject Headings:* **1. Fog 2. Stratus clouds 3. Lisbon, Portugal.**

3F–126 551.509.34:551.575.1:551.576.1

Jefferson, Geoffrey J., **Method of forecasting the time of clearance of radiation fog or low stratus.** *Meteorological Magazine*, London, 79(934):102–109, April **1950.** 5 figs., table, 3 refs. **DWB**—Assuming that the temperature required for clearance can be estimated, time of clearance on a fine morning can be forecast by assuming that heat absorbed by surface layers is constant for time of year, adjusted by a "delay factor" based on thickness of fog or cloud. Percentage transmission of incident radiation is based on water content of fog. Seven examples are analyzed; method most useful in spring and autumn. (*Same abstract* as No. 6–23 in June 1950 *Meteorological Abstracts.*) *Subject Headings:* **1. Fog forecasting 2. Stratus cloud forecasting.**—*C.E.P.B.*

3F–127 551.575:551.521.63

Miyake, Y. and Saruhashi, K., **The estimation of the height of fog by observing the ultraviolet solar radiation.** *Geophysical Magazine*, Tokyo, 21(2):122–125, March **1950.** 4 figs., table, 5 refs., 2 equations. **MH-BH**—The relationship between ultraviolet radiation and the height of fog is investigated by a method that involves the photochemical reaction of ultraviolet rays with leucobase of crystal violet. Ultraviolet radiation is diminished by fog and a high negative correlation exists between thickness of fog and intensity of ultraviolet radiation. An empirical equation expressing this relationship is presented. (*Same abstract* as No. 10–119 in October 1950 *Meteorological Abstracts.*) *Subject Headings:* **1. Fog depth 2. Ultraviolet light.**—*I.L.D.*

3F–128 551.576.11:551.509.3

Neiburger, Morris, **Physical processes associated with summer stratus in California.** *International Union of Geodesy and Geophysics, Association of Meteorology, Transactions*, Oslo 1948, 2:134–135, **1950.** Mimeographed. **DWB**—The presence of the stratus is closely connected with existence of a strong and extensive inversion that characterizes the eastern and southern sides of the subtropical anticyclones. The stratus top coincides almost exactly with the inversion, the position and temperature of which are critical for the occurrence of stratus. The diurnal variations of inversion height, the importance of diurnal winds in producing diurnal variation of the inversion, the results of measurement of drop size, liquid water content and transmission and reflection of sun and sky radiation in the cloud are discussed. (*Same abstract* as No. 3.1–130 in Jan. 1952 *Meteorological Abstracts.*) *Subject Headings:* **1. California stratus 2. Temperature inversion 3. California.**—*I.L.D.*

3F–129 551.574.1:551.576

†Perrie, D. W., **Cloud physics.** New York, John Wiley and Sons, **1950.** 119 p. 7 figs., 30 plates, append. with 3 tables, glossary, biblio. p. 109–114. **DWB**—An excellently illustrated and readable book on many aspects of cloud forms, cloud formation and cloud physics. Chapters on condensation and sublimation nuclei, natural and artificial precipitation, cloud observation and forecasting, effects of clouds on aviation, optical and electrical phenomena associated with clouds, and clouds in the stratosphere (noctilucent and nacreous clouds) are none too technical for the ordinary layman to understand. There is a good guide to cloud identification and an unannotated bibliography of over 100 references. (*Same abstract* as No. 2.5–125 in May 1951 *Meteorological Abstracts.*) *Subject Headings:* **1. Cloud formation 2. Cloud classification 3. Cloud physics.**—*M.R.*

3F–130 551.555.1:551.513.2(265)

*†Riehl, Herbert, Yeh, Tu-cheng, Malkus, Joanne Starr and La Seur, Noel E., **The northeast trade of the Pacific Ocean.** Chicago, University, Dept. of Meteorology, Nov. **1950.** 24+leaves. 24 figs., 3 tables, 30 refs., 18 equations. **MH-BH**—The main contributions to our knowledge of energy exchange between the oceans and the atmosphere and between the tropics and the polar regions are reviewed. Specific data for a section of the North Pacific (northeast of Hawaii) are collected and analyzed by means of energy diagrams and cross sections (from the sea surface to 3 km). It is shown that downward transfer of mass takes place through the trade inversion. Calculations of energy balance show that there is a net transport of latent heat upward and away from the area. Momentum and moisture balance are also calculated and discussed. (*Same abstract* as No. 2.4–113 in April 1951 *Meteorological Abstracts.*) *Subject Headings:* **1. Atmospheric circulation 2. Trade winds 3. Energy transport 4. Energy exchange 5. North Pacific Ocean. I. Chicago. University. Dept. of Meteorology.**—*M.R.*

3F–131 551.575:551.576:551.509.5

Simon, Albert, **Methods of stratus and fog forecasting for Payne Field (Farouk Airport) and vicinity, Egypt.** *American Meteorological Society, Bulletin,* 31(7):257–263, **1950.** 8 figs., tables. **DWB**—Summer fog and stratus is most frequent under a subsidence inversion in moist air advected from the Mediterranean. Winter fog forms in warm moist air advected from the Mediterranean which is usually cooled by radiation. Surface and upper air winds and temperature and humidity conditions are tabulated and a prediction diagram presented based on dew point and dry bulb temperatures at 1800 GMT. (*Same item* as No. 2.1–50 in Jan. 1951 *Meteorological Abstracts.*) *Subject Headings:* **1. Fog forecasting 2. Stratus cloud forecasting 3. Farouk Airport, Egypt.**

1951

3F–132 551.574.1

Best, A. C., **The size of cloud droplets in layer-type clouds.** *Royal Meteorological Society, Quarterly Journal,* 77(332):241–248, April **1951.** 6 tables, 10 refs. **MH-BH**—The maximum size of droplets on salt nuclei, time required to grow from radius 0.75μ to 1–50μ, corresponding fall distance and average radius in a cloud are calculated, assuming various sized nuclei, temperatures and degrees of supersaturation. Rate of growth is compared with that calculated by Howell. The calculated radii reached before droplet is removed from the cloud by turbulent diffusion or gravity agree well enough with the results of observation. (*Same abstract* as No. 2.6–93 in June 1951 *Meteorological Abstracts.*) *Subject Headings:* **1. Cloud physics 2. Drop size distribution.**—*C.E.P.B.*

3F–133 551.509:551.576

*Bull, George Arthur, **Stratus cloud near the east coast of Great Britain.** *Great Britain, Meteorological Office, Professional Notes,* No. 103, **1951.** 16 p. 7 figs., 6 tables, 14 refs. **DWB**—A stratus cloud unassociated with fronts forms over the North Sea and east coast of Great Britain in high pressure weather with easterly winds. For this stratus to form there must be turbulence to the condensation level. The condensation level can be determined by the adiabatic chart although ceilings are usually a little higher than this due to mixing with the drier air aloft. The surface temperature necessary to dissipate the cloud can be estimated by projecting the temperature at the top of the cloud adiabatically to the surface pressure. A subsidence inversion is usually present with this stratus but it is not a necessary condition to its formation. Dissipating factors discussed are: increase in surface temperature, increase in wind speed, absorption of solar radiation, and subsidence. Detailed tables of data for Felixstowe are given which show that, except in winter, there is a strong tendency for the cloud to clear during the day. To forecast clearing, estimate the time of dissipation temperature. If northeast wind persists clouds will return at night even if they have cleared during the day. *Subject Headings:* **1. Stratus clouds 2. North Sea 3. Great Britain.**

3F–134 551.521.3:551.576

Fritz, Sigmund and MacDonald, Torrence H., **Measurement of absorption of solar radiation by clouds.** *American Meteorological Society, Bulletin*, 32(6):205–209, June **1951.** 4 figs., 2 tables. **DWB**—The radiation entering and leaving both the top and base of clouds was measured by means of aircraft equipped with pyrheliometers. The methods of measurement, the observations which were made at Madison, Columbia, Missouri and Washington, D. C., and the sources of error are discussed. The absorption values for Madison and Columbia obtained by the aircraft measurements are close to the computed values while those for Washington are considerably higher (an absorption value of 20%) as compared with the computed values (about 10%). (*Same abstract* as No. 3.5–187 in May 1952 *Meteorological Abstracts.*) *Subject Headings:* **1. Absorption by clouds 2. Airplane observations 3. Pyrheliometer measurements.**—*I. L. D.*

3F–135 551.576:551.521.2

Gifford, Frank, Jr., **Nocturnal radiational cooling, and the lowering of the base of low stratus overcasts. A meteorological forecasting investigation for improving the prediction of airport acceptance rates.** *U. S. Weather Bureau, Technical Report* No. 3, March 28, **1951.** 6 figs., 24 refs. **DWB**—Cooling due to nocturnal radiation should lower the base of the stratus in a turbulent layer which has stratus overcast at its top. A formula is developed making some consequent lowering of the stratus base but with poor results as an explanation of actually observed cases, especially in those with ceilings above 1500 feet. The author suggests possible improvement if the assumption is not made that the turbulent layer remains of constant depth. *Subject Headings:* **1. Stratus clouds 2. Radiational cooling.**

3F–136 551.576.1

Kraght, Peter E., **Temperature and moisture gradients under low stratus cloud.** American Airlines, Inc., Dec. **1951.** 32 p. fig., 3 tables, 22 refs., 22 equations. **DWB**—This study, based on 10,828 cases of ceilings 1000 ft or lower from selected U. S. and Canadian stations, develops the formula $H = 2.78(t_0 - t_{d_0}) + 0.2$, where H is ceiling in hundreds of feet and t_0 and t_{d_0} are surface temperatures and dew point temperature °F. Historical development of and theoretical factors bearing on this relationship are discussed. *Subject Headings:* **1. Ceiling height 2. Stratus clouds. I. American Airlines, Inc.**

3F–137 551.575/6.1

Unger, Charles D., **A study of fog and stratus at the Los Angeles International Airport.** Los Angeles, Calif., American Airlines, Inc., [n.d.] 14 p. 2 graphs, equations. **DWB**—The author attempts to develop an objective method of forecasting low stratus and fog at Los Angeles between the hours of sunset and midnight from data available at 1345 PST. Pressure and temperature gradients and convergence factors are evaluated for conditions essentially static. When changing conditions are expected, the pressure gradient (STH) Santa Maria (SFO) San Francisco at 1328 P and 0130 P and change in inversion height are considered. If the 12 h change in STH–SFO pressure gradient is less than +1.0 mb or is negative, low ceilings are forecast. *Subject Headings:* **1. Ceiling height forecasting 2. California stratus 3. Objective forecasting 4. Los Angeles, California. I. American Airlines, Inc.**

PART III. METEOROLOGICAL ARTICLES APPEARING IN RECENTLY ISSUED PUBLICATIONS

Note: The contents of periodicals included in this section are for information only, and will not be listed in the monthly indexes until abstracted. When material is furnished in advance of date of publication, the pagination may be omitted.

American Meteorological Society, Bulletin, Volume 33, Number 3, March 1952.

McClain, Paul E.: **Synoptic investigation of a typical situation in Montana,** p. 87–94.

Crozier, W. D., Seely, B. K. and Wheeler, L. B.: **Correlation of chloride particle abundance with the synoptic situation on a cross country flight,** p. 95–100.

Mackay, G. A.: **The effect of protracted spring thaws on ice conditions in Hudson Bay,** p. 101–106.

Colson, DeVer: **Results of double-theodolite observations at Bishop, Cal., in connection with "Bishop-Wave" phenomena,** p. 107–116.

Pearson, C. A.; Koomen, M. J. and Tousey, R.: **Visual measurements of atmospheric transmission of light at night,** p. 117–121.

Potter, John: **Notes on the structure of a hurricane in its late mature stage,** p. 122–123.

Reynolds, S. E. and Braham, Roscoe: **Significance of the initial radar echo,** p. 123.

Riehl, Herbert: **On irregular movement of tropical storm,** p. 123.

Jordan, Charles L.: **Notes on "Irregular movements of tropical cyclones in the Pacific" by Capt. John D. Horn, USAF,** p. 124.

American Meteorological Society 116th National Meeting—June 16–18, 1952, p. 125–128.

Angewandte Meteorologie, Potsdam, Volume 1, Number 5, May 1952.

Fieber, S.: **Untersuchungen über die Auslösung des Myokardinfarktes durch meteorologische und solare Faktoren,** [Investigations of the outbreak of cardiacal failures caused by meteorological and solar factors], p. 129–136.

Hesse, W.: **Langfristige Witterungsvorhersage für die Landwirtschaft vor 800 Jahren?** [Long range weather forecast for agriculture 800 years ago?], p. 136–137.

Ortmeyer, W.: **Hagelschäden und Hagelverteilung in Sachsen,** [Hail damage and hail distribution in Saxony], p. 138–139.

Mäde, A.: **Zur Methodik phänologischer Kartenentwürfe,** [Methodology of drawing phenological charts], p. 139–142.

Rassow, L.: **Wachstumsgebiete in Sachsen-Anhalt,** [Vegetation regions in Saxony-Anhalt], p. 142–146.

Morawetz, Sieghard: **Kleinklimatische Beobachtungen in der Weststeiermark bei St. Stefan ob Stainz,** [Microclimatic observations in western Steiermark near St. Stefan ob Stainz], p. 146–150.

Burckhardt, Hans: **Lokale Klimaänderungen auf einem Berggipfel durch Kahlhieb,** [Local climatic variations on a mountain top through deforestation], p. 150–154.

Schrödter, H.: **Untersuchungen über die Wirkung einer Windschutzpflanzung auf den Sporenflug und das Auftreten der *Alternaria*-Schwärze an Kohlsamenträgern,** [Investigations of the action of a wind break on spore dispersion and on the appearance of black-mold on cabbage seed pods], p. 154–158.

Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. A, Volume 5, Number 1, 1952.

Arakwa, H.: **The anticyclonic eddies just south of jet stream,** p. 1–4.

Čadež, M.: **Sur l'énergie potentielle du champ barique,** [Potential energy of the baric field], p. 5–16.

James, R. W.: **On the vertical structure of pressure and wind fields,** p. 17–35.

Schüepp, W.: **Beobachtungen und Überlegungen zum tagesperiodischen Luftmassenaustausch,** [Observations and speculations on the daily air mass exchange], p. 36–43.

Junge, Chr.: **Bemerkungen zur Frage der Eiskeimbildung im frostübersättigten Bereich,** [Remarks on the problem of ice nuclei formation in frost-supersaturated regions], p. 44–45.

Kasemir, H. W.: **Studien über das atmosphärische Potentialgefälle V. Zur Strömungstheorie des luftelektrischen Feldes II.,** [Studies on the atmospheric potential gradient. V.

On the current theory of the atmospheric electric field, II], p. 56–70.

Israël, H. and Kasemir, H. W.: **Studien über das atmosphärische Potentialgefälle VI. Beispiele für das Verhalten luftelektrischer Elemente bei Nebel,** [Studies on the atmospheric potential gradient VI. Examples of the behavior of air electric elements during fog], p. 71–85.

Wichman, H.: **Die Messung des luftelektrischen Feldes mit radioaktiven Potentialsonden,** [Atmospheric electric field measurement with radioactive potential sondes], p. 86–99.

Pollak, L. W. and Murphy, T.: **Sampling of condensation nuclei by means of a mobile photoelectric counter,** p. 100–119.

Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. B, Volume 4, Number 1, 1952.

Sauberer, Franz: **Messungen der Infrarotdurchlässigkeit von Nebel mit Bleisulfid-Photowiderständen,** [Measurements of infrared transmission of fog with lead sulfide photoresistances], p. 1–13.

Schedler, A.: **Ein Beitrag zur Kenntnis der Global- und Himmelsstrahlung im Hochgebirge der Alpen,** [Contribution to the knowledge of global and sky radiation in the high Alps], p. 14–25.

Bouët, M.: **Le brouillard dans les Alpes valaisannes,** [Fog in the Valais Alps], p. 26–33.

Mayer, R.: **Über den Zusammenhang der interdiurnen Veränderlichkeit mit der Dispersion des Luftdrucks,** [Relation between the interdiurnal variability and the dispersion of air pressure], p. 34–42.

Dirmhirn, Inge: **Oberflächentemperaturen der Gesteine im Hochgebirge,** [Surface temperatures of rocks in high mountains], p. 43–50.

Karapiperis, Ph. P.: **Interhourly variability of temperature at Blue Hill, Mass.,** p. 51–64.

Trappenberg, R.: **Untersuchungen über die mikroklimatischen Wirkungen künstlicher Beregnung im Tabakbestand,** [Investigations of the microclimatic effect of artificial rain on tobacco crops], p. 65–85.

Fladung, H. J.: **Plötzlicher Herztod und Wetter,** [Sudden heart failure and weather], p. 85–96.

Australian Journal of Scientific Research, Ser. A, Physical Sciences, Volume 4, Number 3, September 1951.

Shain, C. A.: **Galactic radiation at 18.3 Mc/s.,** p. 258–267.

Kannuluik, W. G. and Carman, E. H.: **The temperature dependence of the thermal conductivity of air,** p. 305–314.

Priestley, C. H. B.: **A survey of the stress between the ocean and atmosphere,** p. 315–328.

James, R. W.: **The structure of steady-state anticyclones,** p. 329–343.

Australian Journal of Scientific Research, Ser. A, Physical Sciences, Volume 4, Number 4, December 1951.

Hill, E. R.: **Collision processes involving highly ionized atoms,** p. 437–449.

Hines, K. C.: **The straggling of electrons below the critical energy,** p. 450–458.

Piddington, J. H. and Minnett, H. C.: **Observations of galactic radiation at frequencies of 1210 and 3000 Mc/s.,** p. 459–475.

Bolton, J. G. and Westfold, K. C.: **Galactic radiation at radio frequencies. IV. The distribution of radio stars in the galaxy,** p. 476–488.

Little, A. G. and Payne-Scott, Rugby: **The position and movement on the solar disk of sources of radiation at a frequency of 97 Mc/s. I. Equipment. II. Noise storms,** p. 489–525.

Australian Journal of Scientific Research, Ser. A, Physical Sciences, Volume 5, Number 1, March 1952.

Jaeger, J. C.: **Approximations in transient surface heating,** p. 1–9.

Huxley, L. G. H.: **The persistence of meteor trails,** p. 10–17.

Piddington, J. H. and Minnett, H. C.: **Radio-frequency radiation from the constellation of Cygnus,** p. 17–31.

Payne-Scott, Ruby and Little, A. G.: **The position and movement on the solar disk of sources of radiation at a frequency of 97 Mc/s. III. Outbursts,** p. 32–46.

Burbury, D. W. P. and Fenton, K. B.: **The high latitude east-west asymmetry of cosmic rays,** p. 47–58.

Squires, P.: **The growth of cloud drops by condensation. I. General characteristics,** p. 59–86.

Smith, E. J.: **The influence of meteorological conditions on rainmaking in the Sydney Area,** p. 87–103.

Chapman, Sydney: **The calculation of the probable error of determinations of the lunar daily harmonic component variations in geophysical data: a correction,** p. 218–222.
Abbey, R. L.: **The velocity of sound in gases at low pressures,** p. 223–225.

Beiträge zur Geophysik, Volume 62, Number 3, 1942.

Hesse, W.: **Max Robitzsch zum 65. Geburtstag,** [Max Robitzsch's 65th birthday], p. 161–163.
Fritsch, V.: **Geoelektrische Untersuchungen an Blitzerdern,** [Geoelectrical investigations on lightning grounds], p. 164–207.
Haalck, H.: **Über die Ursachen des magnetischen Rindenfeldes der Erde,** [Cause of the magnetic field in the earth's crust], p. 208–221.
Macht, H. G.: **Die Potentialanteile zweiter und höherer Ordnung des Erdmagnetfeldes. II,** [The potential components of second and higher order in the geomagnetic field], p. 222–247.

Franklin Institute, Journal, Volume 253, Number 5, May 1952.

Schonland, B. F. J.: **The work of Benjamin Franklin on thunderstorms and the development of the lightning rod,** p. 375–392.
Cohen, Bernard: **Prejudice against the introduction of lightning rods,** p. 393–440.
McEachron, K. B.: **Lightning protection since Franklin's day,** p. 441–470.
Norinder, Harald: **Experimental lightning research,** p. 471–504.

Indian Journal of Meteorology and Geophysics, Delhi, Volume 3, Number 1, January 1952.

Sinha, K. L.: **An analysis of the space distribution or rainfall in India and Pakistan,** p. 1–16.
Sarma, V. Vital: **An analysis of the rainless days of Delhi,** p. 17–24.
Bhullar, G. S.: **Onset of monsoon over Delhi,** p. 25–30.
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CUMULATIVE AUTHOR INDEX

JAN. 1950 TO JUNE 1952

Note: This author index has been compiled and edited in an attempt to serve a triple purpose. First, it is a *semi-annual index to the January–June 1952* issues, as in the June issue of previous volumes. In order to use it as such, the reader should pay attention to only those entries which are in bold face type, (e.g., **Ångstrom, Anders Knutson . . . 3B–131, 3B–133, 3B–134**).

In addition, this index will serve as a cumulative author index for Vol. 1 and 2. Authors and/or entries in Volume 1 will be in light face type with numbers 1– to 11– indicating items in Part II of issues 1 to 11 (Jan.–Nov.) 1950, and A– to K– items in Part II (Special Bibliographies) for the same period. Similarly items beginning with 2.1– to 2.11–, and 2A– to 2K– will be found in respective issues of Volume 2, 1951. Bold face entries 3.1– to 3.6– and 2A– to 3F– are, as stated above, those found in the Jan.–June issues of Volume 3, 1952. Items appearing only as entries in Part III (not abstracted or classified) are given as in: Ackerman, W. C., V. 1, p. 206, (indicating the volume and page on which the author's name appears). It is necessary in these instances to indicate the Volume and Page numbers since pagination begins over again with each volume, and such entries are not numbered.

Finally, but most important of all, this index is a preliminary attempt to compile an **authority roster** of or for meteorologists and Special Libraries. Similar efforts have been made for scientists in general, in *American Men of Science*, and *Poggendorfs Biographisch-literarisches Handwörterbuch*—both reference tools for establishing the identity of an author now and in years to come. KARL KEIL has given brief biographical information in his *Handwörterbuch der Meteorologie* for a number of German and a few well known non-German meteorologists. These authorities have proven very valuable in checking and compiling this and other indexes.

Because the amount of searching and checking necessary to provide even a partially complete authority list would be beyond the resources of this project during the present decade, it was thought that a short-cut could be achieved, saving at least 5 years in the accomplishment of the same results, if each author would mail a post card to this office (P. O. Box 1736, Washington 13, D. C.) giving **as a minimum** essentially the information included in *italics* after such names as **Angstrom, Anders Knutson** (*b. 2–28–1888, Stockholm*)—that is the *full name* (not just initials), date and place of birth if available. We would appreciate in addition information (as below under **Abbot, Charles Greely,**) under the following heads:

1. Full name with preferred spelling in case of an alternative.
2. Date and place of birth.
3. Nationality, where it differs from country of birth.
4. Education, degrees and years granted.
5. Principal professional achievements or positions.
6. Main field of scientific work.
7. Journals in which his outstanding scientific articles have appeared, and titles of principal published books or monographs.

Thus, any author who wants to insure that in future years his publications will be properly and accurately credited, can do so at little more expense than the cost of a letter or a postal card. Obviously, such first-hand information will be more complete and reliable than that which has been copied from second or third-hand sources and will be less costly in time and effort. Experience with *Poggendorff* indicates that such information will be copied and recopied for generations, if libraries find the entries reliable. In the past only authors of books or monographs received such attention as is now for the first time being given to writers of scientific articles.

Anyone who *wishes* to have "junior," Miss, Mrs. or any other similar identification attached to entries should so indicate, and anyone who writes or has written under a *pseudonym*, or alternate spelling, should indicate which name is preferred as the main entry.

Naturally, we will appreciate having errors in *identity* or spelling of authors or in other information called to our attention. Judging by the number of errors which have been discovered in editing and compiling this list of eight thousand authors, it is likely that errors still exist.

It will also be appreciated if similar information is furnished (by *anyone* willing to cooperate) about authors who are deceased, or unlikely, or unable to communicate with us (especially information on death of any writer *not* given herein).

This initial effort is included in the mid-year index (to the exclusion of subject and journal indexes) because there is not time or space for inclusion in the more comprehensive annual indexes. The bibliographical data have been compiled by **Dorothy M. Gropp** from as many sources as was possible in the limited time available.

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Note: Entries in **bold face** appeared in **Jan.–June 1952** issues. Other entries will be found in **volumes 1 and 2** (1950 and 1951).